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Bureau of Land Management

Final

Coos Bay District Office
1300 Airport Lane
North Bend, Oregon 97459

September 1994

Coos Bay District Proposed Resource Management Plan Environmental Impact Statement

Volume I

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interest of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

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United States Department of the Interior

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BUREAU OF LAND MANAGEMENT
COOS BAY DISTRICT OFFICE
1300 AIRPORT LANE
NORTH BEND, OREGON 97459-2000

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In Reply Refer to:
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September 1994

Dear Public Land User:

Enclosed for your review and comment is the Proposed Resource Management Plan (PRMP)/Final Environmental Impact Statement (FEIS) for the Coos Bay District, Oregon. The Bureau of Land Management has prepared this document in partial fulfillment of its responsibilities under the Federal Land Policy and Management Act of 1976 and the National Environmental Policy Act of 1969.

The Proposed RMP/Final EIS is designed to stand alone from the Draft RMP/EIS which was published in August 1992. However, you may find the Draft RMP/EIS to be a useful reference document. A copy of the Draft RMP may be obtained from this office.

The public devoted substantial effort to providing indepth input on the Draft RMP/EIS. The Coos Bay District received 954 individual comment letters containing over 8,450 comments. The Planning Team has assessed these comments and utilized the input in making substantive changes in the Proposed RMP and strengthening the EIS. We sincerely appreciate the efforts of those who took the time to provide us with their comments. We feel that your efforts have resulted in a stronger and clearer RMP.

This Proposed RMP/Final EIS contains a summary comparison of the alternatives analyzed in depth, an introduction, a description of the Proposed Plan and other alternatives analyzed, an affected environment description, the environmental consequences of the Proposed Plan and other alternatives, substantive (more than opinion) public comments received on the Draft RMP/EIS, and our response to those comments. The Preferred Alternative in the Draft RMP has been revised as a result of public comment, internal review, and the decisions made by the Secretaries of Interior and Agriculture following completion of the Supplemental Environmental Impact Statement on Management of Habitat for Species Within the Range of the Northern Spotted Owl. This revision has become the Proposed Resource Management Plan which reflects these changes in the refinement of management objectives and in management actions.

If you desire assistance in understanding this document, you may contact RMP Team Leader Bob Gunther at (503) 756-0100. Informal open house meetings will be held at the district office (at the above address) to give you an opportunity to discuss the Proposed RMP/Final EIS with BLM employees. The dates, times, and locations of all open house meetings will be announced in a separate mailer and in the local media.
An executive summary of all six of BLM's western Oregon Proposed Resource Management Plans has been published by BLM's Oregon State Office. A copy may be obtained in the local North Bend office or by writing the State Office at P.O. Box 2965, Portland, Oregon 97208.

If you would like me to further consider your interests/concerns as I make the final decisions which will guide the management of the public lands in the planning area for the next 10-15 years, please identify them in writing within 30 days after the Environmental Protection Agency publishes its Notice of Availability in the Federal Register.

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Comments should be sent to:

District Manager
Bureau of Land Management
Coos Bay District Office
1300 Airport Lane
North Bend, Oregon 97459

The final decisions will be based on the analysis in the EIS, any additional data available, public input, management feasibility, policy, and legal constraints. Approval of the plan will be documented in a record of decision which will be made available to the public and mailed to all parties who were mailed this document or the summary. It is also important to note that RMP implementation usually involves further analysis and decision making, including public involvement and allows for protest of adverse decisions under 43 CFR Parts 4 and 5000.

The resource management planning process includes an opportunity for administrative review via a plan protest to the BLM Director if you believe the approval of a proposed RMP would be in error under 43 CFR 1610.5-2. Careful adherence to these guidelines will assist in preparing a protest that will assure the greatest consideration to your point of view.

Only those persons or organizations who participated in our planning process leading to this proposed RMP may protest. If our records do not indicate that you had any involvement in any stage in the preparation of the proposed Coos Bay District RMP, your protest will be dismissed without further review. A protest must also be limited to a single proposed RMP, even if the issue or concern involves more than one proposed RMP. Protests that challenge proposed decisions in more than one proposed RMP will not be accepted by the Director. In effect, if you may be adversely affected by more than one RMP, you must file an individual protest for each RMP citing why and where that particular RMP is incorrect or not in compliance with existing laws, regulations, etc.

Protests of proposed plan elements that merely adopt decisions made in the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* and *Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* signed by the Secretary of the Interior will be dismissed, as the Director will not overturn a decision which the Secretary has already directed to be adopted in BLM's new resource management plans.

A protesting party may raise only those issues which he or she submitted for the record during the planning process. New issues identified during the protest period should be directed to the District Manager for consideration during plan implementation, as potential plan amendments, or as otherwise appropriate. If an issue is shared by several individuals or landowners or interest groups, a combined protest on the common neighborhood issue or concern may be mutually more efficient and effective. For example, several landowners in a portion of the planning area may wish to combine their concerns on a proposed land allocation or management issue that affects their common interests in a given watershed.

The period for filing a plan protest begins when the Environmental Protection Agency publishes in the Federal Register its Notice of Availability of the final environmental impact statement concerning the proposed RMP or amendment. The protest period extends for 30 days after publication of the Notice of Availability. There is no provision in BLM's regulations for any extension of time, and no extensions for filing protests will be granted. To be considered timely, your protest must be postmarked no later than the last day of the protest period. Although not a requirement, we suggest that you send your protest by certified mail, return receipt requested.

Protests must be filed in writing to:

Director (760)
Chief, Planning and Environmental Coordination
Bureau of Land Management
1849 "C" Street, NW
Washington, D.C. 20240

To be considered complete, your protest must contain, at a minimum, the following information:

-Name, mailing address, telephone number, and interest of the person filing the protest.

-A statement of the issue or issues being protested.

-A statement of the part or parts of the specific (named) proposed RMP being protested. To the extent possible, this should be done by reference to specific pages, paragraphs, sections, tables, maps, etc. included in the document.

-A copy of all documents addressing the issue or issues that you submitted during the planning process or a reference to the date the issue or issues were discussed by you for the record.

-A concise statement explaining why the BLM State Director's decision is believed to be incorrect. This is a critical part of your protest. Document all relevant facts. As much as possible, reference or cite the planning documents, environmental analysis documents, and available planning records (e.g., meeting minutes or summaries, or correspondence). A protest that merely expresses disagreement with the Oregon/Washington State Director's proposed decision, without any data, will not provide us with the benefit of your information and insight. In this case, the Director's review will be based on the existing analysis and supporting data.

Before deciding to file a protest, I encourage you to contact me or Bob Gunther to determine if your concerns might be met in some way other than via a protest or to assist you in the protest process if it is appropriate.

Thank you for your continued interest in the multiple use management of your public lands.

Sincerely,

Melvin E Chase

Melvin E. Chase
District Manager
Coos Bay District

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U.S. Department of the Interior
Bureau of Land Management

Final Proposed Resource Management Plan and Environmental Impact Statement

Prepared by
Coos Bay District

September 1994

Elaine Y. Zielinski

Elaine Y. Zielinski
State Director
Oregon/Washington

Melvin E Chase

Melvin E. Chase
District Manager
Coos Bay District

Draft ( ) Final (X) RMP/EIS

Department of the Interior

Bureau of Land Management

1. Type of Action: Administrative (X) Legislative ( ).

2. Abstract: This Proposed Resource Management Plan/Final Environmental Impact Statement addresses resource management on 329,679 acres of federal land and 12,152 acres of reserved mineral estate administered by the Bureau of Land Management in its Coos Bay District. The Proposed Resource Management Plan responds to the need for a healthy forest ecosystem with habitat that will support populations of native species (particularly those associated with late-successional and old-growth forests). It also responds to the need for a sustainable supply of timber and other forest products that will help maintain the stability of local and regional economies, and will contribute valuable resources to the national economy on a predictable and long-term basis. BLM-administered lands are primarily allocated to Riparian Reserves, Late-Successional Reserves, General Forest Management Areas, and Connectivity/Diversity Blocks. An Aquatic Conservation Strategy would be applied to all lands and waters under BLM jurisdiction. Nine new Areas of Critical Environmental Concern will be designated, and recreation facilities would be provided at selected locations. No rivers would be found suitable for designation under the Wild and Scenic Rivers Act.

3. The protest and comment period will end 30 days after the Environmental Protection Agency publishes its Notice of Availability in the Federal Register.

4. For further information contact:
   Bob Gunther
   RMP/EIS Team Leader
   Bureau of Land Management
   Coos Bay District Office
   1300 Airport Lane
   North Bend, OR 97459-2000

User's Guide

The Summary presents a synopsis of the Proposed RMP/EIS. It summarizes all alternatives, land use allocations for all issues, environmental consequences, monitoring, consistency with other government entities, and public involvement. More detail is presented for the Proposed Resource Management Plan.

Chapter 1 (Introduction to the draft RMP/EIS) describes the planning area and the purpose and need for preparing the RMP/EIS. It includes a discussion of the RMP's relationship to BLM policies, programs, and other plans; describes the planning process and planning criteria; and identifies the issues or concerns addressed in the RMP/EIS process.

Chapter 2 (Description of the Alternatives) has four major sections: Management Direction for the Proposed Resource Management Plan, Management Direction Common to Alternatives A Through E, Management Direction by Alternative, and Management Direction Common to All Alternatives. The first section is particularly important to understanding how lands would be managed under the Proposed Management Plan. The seven different alternatives described respond to the 11 issues identified in Chapter 1 by providing a mix of uses and actions that could resolve the issues. Included in Chapter 2 is a tabular summary of the alternatives for their comparison. Maps displaying the major land use allocations for the Proposed Resource Management Plan are located in a map packet included with this document. Maps of Alternatives A through E were included in the draft RMP/EIS and have not been reprinted, but a copy may be obtained from this office.

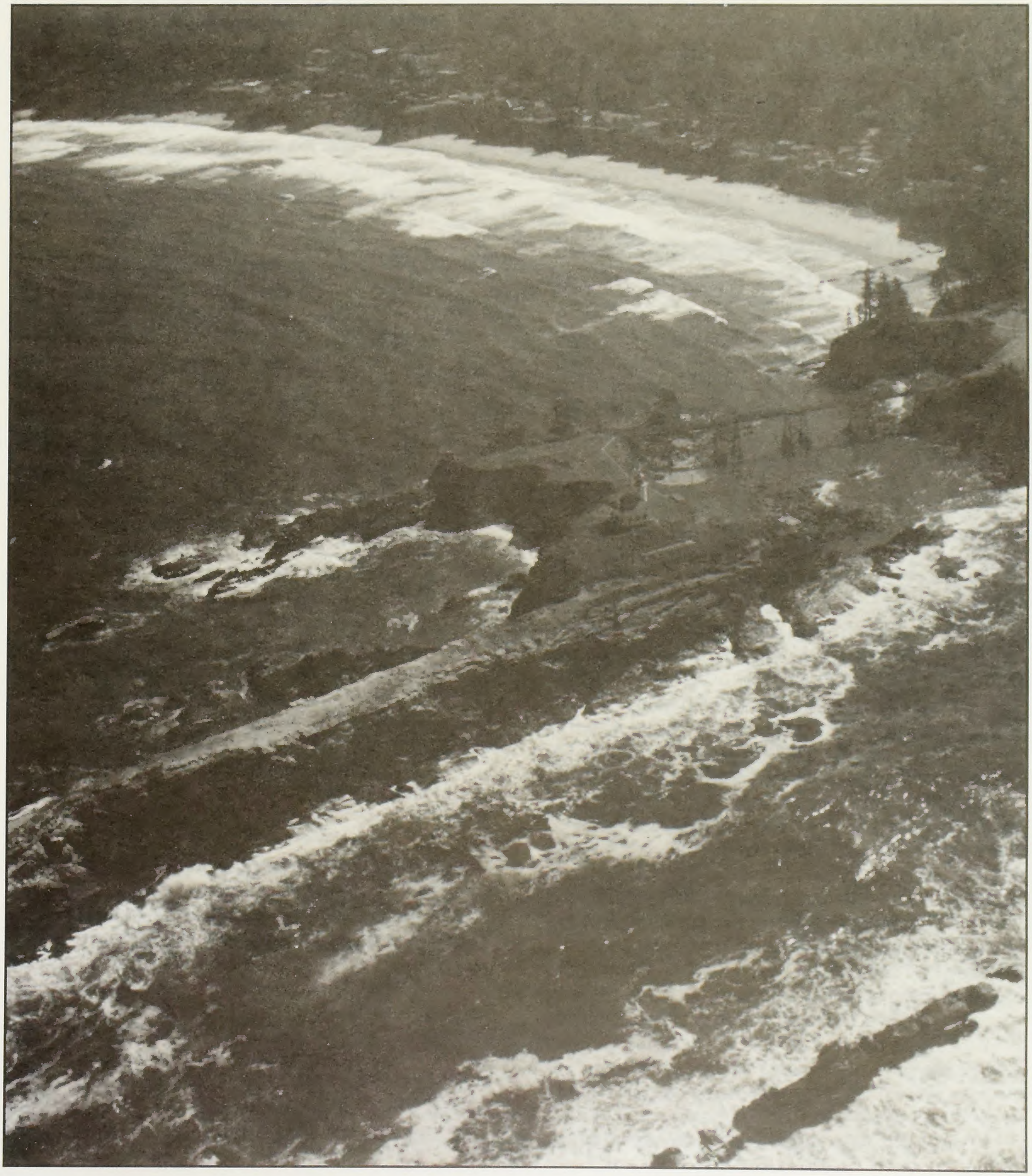
Chapter 3 (Affected Environment) describes the environment that could be affected or changed by implementing any of the alternatives. This chapter includes a description of the resources (e.g., water, vegetation, wildlife habitat, and visual) and major uses (e.g., recreation and timber harvest) related to the issues.

Chapter 4 (Environmental Consequences) describes potential impacts and changes to the affected environment of the various alternatives. It includes an overview of each alternative's relationship to plans and programs of other government agencies.

Chapter 5 identifies agencies and organizations BLM has worked with during the preparation of the RMP/EIS, discusses any relevant relationships with the other agencies, and summarizes public involvement.

Chapter 6 contains the Glossary, References cited in the document, and the index.

Summary



Summary

Introduction

The Coos Bay Resource Management Plan (RMP) will establish guidelines for the management of BLM-administered land in the Coos Bay District for at least ten years. It will supersede and replace the management framework plan and plan amendment covering the same area, completed in 1983 and 1984. The Proposed RMP/Final EIS has been prepared in accordance with the BLM planning regulations issued under authority of the Federal Land Policy and Management Act and written in accordance with Council on Environmental Quality regulations issued under authority of the National Environmental Policy Act.

BLM-administered lands in the planning area consist of 218,488 acres of O&C lands; 60,338 acres of Coos Bay Wagon Road (CBWR) lands; 50,493 acres of public domain (PD) lands; 360 acres of acquired lands; plus 12,152 acres of split estate (federal minerals).

Alternatives

Seven alternatives were developed to provide a range of responses to major issues identified earlier in the planning process. These issues are: timber production practices; old-growth forests; habitat diversity; threatened and endangered species habitat; special areas; visual resources; stream, riparian and water quality protection; recreation resources, including wild and scenic rivers; land tenure; and rural interface areas. Of particular interest is whether or not to harvest the remaining old-growth forests and the treated effects on regional and local economies, biological diversity, and the northern spotted owl—a federally-listed threatened species.

Each alternative offers a possible broad course of action that, if selected, would provide guidelines for future, more specific decisions. Site-specific management for various resources; annual timber sale plans; and issuance of rights-of-way, leases, or permits will follow the guidelines identified in the RMP.

The land use or resource allocations of the alternatives are summarized in Table S-1, at the end of the summary section. Acres displayed in this table may overlap or be partially duplicated. Analysis of effects of each alternative except No Action has been facilitated by development of 10-year representative timber management scenarios. These reflect possible timber harvest units, roads, and timber management practices during the first ten years of the RMP. These scenarios include different levels of forest management practices (also shown in Table S-1). Anticipated environmental consequences of the alternatives are summarized in Table S-2, also located at the end of the summary.

A summary of the Proposed Resource Management Plan (PRMP), the No Action alternative (NA), and Alternatives A, B, C, D, and E follows. A map of the management strategy for the PRMP is in the enclosed map packet. (If you received only this summary, rather than the full Proposed RMP/FEIS, only the PRMP map is enclosed.)

The Proposed Resource Management Plan (PRMP)

This alternative would emphasize ecosystem management. Resources would be managed with an emphasis on retention of late-successional forests, restoration and/or maintenance of watershed conditions, protection of special status and other species requiring special attention, and a variety of other land uses.

A system of Late-Successional Reserves would be established and be managed under the concepts of Ecological Principles for Management of Late-Successional Forests. Riparian Reserves would be established with the width determined by stream characteristics or type of water body. Management activities in Riparian Reserves would be guided by Aquatic Conservation Strategy objectives. Activities in the General Forest Management Area portion of the Matrix would emphasize production of forest products to contribute to community stability, but a biological legacy of previous stands would be retained (e.g., green trees, snags, and down woody debris). Connectivity/Diversity Blocks— which are also a portion of the Matrix—would be established to provide dispersal, foraging, and/or support habitat for old-growth associated species; they would be managed by growing forests on long rotations and retaining more of the stands at harvest. Habitats of threatened and endangered species, species proposed for such status, species with a high potential for federal listing as threatened or endangered, and other species requiring special attention would be protected. The New River Area of Critical Environmental Concern (ACEC) and Cherry Creek Research Natural Area (RNA) would be retained; also the Cherry Creek RNA and nine new areas would be designated as ACECs. No rivers would be found suitable for designation as wild, scenic, or recreational. Scenic resources would be managed in selected special status and high use areas. Recreation management would provide a wide range of recreational opportunities. Special forest management practices would be applied in rural interface areas.

No Action

This alternative would entail no change from the management direction established in BLM's current Management Framework Plans (except where Congress has since enacted legislation prescribing different management direction for specific geographic areas or transferring specific lands to the administration or ownership of other parties). It would emphasize timber production to contribute to community stability, consistent with the variety of other land uses. Blocks of mature and old-growth forests would be retained in a system to provide for habitat diversity and contribute to ecological functions important for timber productivity. Habitat of threatened and endangered species and species proposed for such status would be protected. Timber harvest would not be planned in riparian areas of third order or larger streams, or streams used for domestic water sources. The New River Area of Critical Environmental Concern (ACEC) and the Cherry Creek Research Natural Area (RNA) would be retained. No rivers would be found suitable for designation as wild, scenic, or recreational. Scenic resources would be managed so that activities such as timber harvesting and road construction would not be visually evident along major travel routes and high use areas. Recreation management would provide for a wide range of developed and dispersed recreational uses.

Alternative A

This alternative would emphasize a high production of timber and other economically important values on all lands to contribute to community stability. It would produce the highest sustained yield of timber on all suitable forest lands legally available for harvest. Habitats of threatened and endangered species and those species proposed for such status would be managed as legally required. Protection would also be given to habitats of other species that have high potential for listing and are known to exist only on BLM-administered lands. To meet legal requirements for protection of wetlands and water quality—as well as protect anadromous fish habitat and other relevant values— riparian zones would be managed according to requirements of the Oregon Forest Practices Act and the Federal Water Pollution Control Act. The New River ACEC and Cherry Creek RNA would be retained. No rivers would be found suitable for designation as wild, scenic, or recreational. Recreation management emphasis would be on existing recreation sites and trails of high use and also dispersed, motorized recreation uses. This alternative would also provide for community economic expansion through the sale or lease of some lands.

Alternative B

This alternative would emphasize timber production to contribute to community stability, consistent with the variety of other land uses on O&C and CBWR lands. Public domain (PD) lands having greater importance for nontimber values and uses other than timber production, however, would be managed primarily for the maintenance of those nontimber values and uses. Blocks of old-growth and mature forest would be retained in a system to contribute to ecological functions important to timber productivity. Habitat of threatened and endangered species and those proposed for such status would be protected. Other species of related concern would be protected to the extent consistent with high timber production. Timber harvest would not be planned in riparian zones of important waters. The New River ACEC and Cherry Creek RNA would be retained; Cherry Creek RNA and two additional areas located on PD lands would be designated as RNA/ACECs; and two areas would be designated as ACECs. No rivers would be found suitable for designation as wild, scenic, or recreational. Scenic resources would be managed in selected special status and high use areas. Recreation management would provide a wide range of developed and dispersed recreation uses. Special forest management practices would be applied in rural interface areas which include lands zoned for 1- to 5-acre residential lots.

Alternative C

This alternative would provide timber production to contribute to community stability consistent with the variety of other land uses. It would emphasize retention and improvement of natural biological diversity, retain a system that maintains some old growth and mature forest, stress connectivity, and focus on areas where special status plant and animal species cluster. Habitats of threatened and endangered species, species proposed for such status, and species with a high potential for federal listing would be protected. Other species of related concern would be protected primarily through the emphasis on biological diversity.

Timber harvest would not be planned in or immediately adjacent to riparian zones of important waters. The existing ACEC and RNA would be retained. Two new ACECs and four new RNA/ACECs would be designated. No rivers would be found suitable for designation as wild or recreational. One river would be found suitable for designation as scenic. Scenic resources would be managed in selected high use areas, with particular emphasis on protection in proposed scenic river corridors. Recreation management would provide a wide range of recreation opportunities, emphasizing dispersed use. Special forest management practices would be applied in rural interface areas which include lands zoned for 1- to 20-acre residential lots.

Alternative D

This alternative would emphasize management and enhancement of values such as diversity of wildlife habitat, dispersed nonmotorized recreation opportunities, and scenic resources, consistent with a variety of other land uses including some timber production. Spotted owl habitat would be protected in accordance with the Interagency Scientific Committee Conservation Strategy for the Northern Spotted Owl. Habitats of threatened and endangered species, species with a high potential for federal listing as threatened or endangered, and species of related concern would be protected. Timber harvest would not be planned in or adjacent to riparian zones of important waters or their immediate tributaries. The existing ACEC and RNA would be retained. Five new RNA/ACECs and four new ACECs would be designated. No rivers would be found suitable for designation as wild or recreational. One river would be found suitable as scenic. All identified scenic resources would be managed. Recreation management would emphasize dispersed nonmotorized opportunities. Special timber harvest and forest management practices would be applied in rural interface areas which include lands zoned for 1- to 20-acre residential lots.

Alternative E

This alternative would emphasize protection of older forests and the management and enhancement of values such as dispersed nonmotorized recreation opportunities and scenic resources. A sustained yield of timber would be produced consistent with the emphasis on these other values. All forest stands 150 years and older would be retained. Habitats of threatened and endangered species, species with a high potential for federal listing as threatened or endangered, and species of related concern would be protected. Timber harvest would not be planned in riparian zones. The existing ACEC and RNA would be retained and nine new ACECs would be designated. No rivers would be found suitable for designation as wild. One river would be found suitable as scenic and six as recreational. All identified scenic resources would be managed and some visual resource protection would be provided for all lands. Recreation management would emphasize dispersed nonmotorized opportunities. Special timber harvest and forest management practices would be applied in rural interface areas.

The Proposed Resource Management PLAN (PRMP)

The PRMP was developed partially in response to public comments related to the Bureau of Land Management's August 1992 draft resource management plans for western Oregon. In addition, the PRMP incorporates the land use allocations and management direction from the 1994 *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* and its Attachment A (hereafter simply referred to as ROD).

Vision

The Bureau of Land Management will manage the natural resources under its jurisdiction in western Oregon to help enhance and maintain the ecological health of the environment and the social well being of human populations.

This vision is supported by several basic principles:

- Natural resources can be managed to provide for human use and a healthy environment.
- Resource management must be focused on ecological principles to reduce the need for single resource or single species management.
- Stewardship—the involvement of people working with natural processes—is essential for successful implementation.

- The Bureau of Land Management cannot achieve this vision alone but can—by its management processes and through cooperation with others—be a significant contributor to its achievement.

- A carefully designed program of monitoring, research, and adaptation will be the change mechanism for achieving this vision.

Strategy

Lands administered by the Bureau of Land Management will be managed to maintain healthy, functioning ecosystems while providing a sustainable production of natural resources. This management strategy—titled ecosystem management—involves the use of ecological, economic, social, and managerial principles to ensure the sustained condition of the whole. Ecosystem management emphasizes the complete ecosystem instead of individual components and looks at sustainable systems and products that people want and need. It seeks a balance between maintenance and restoration of natural systems and sustainable yield of resources.

The building blocks for this strategy are comprised of several major land use allocations: Late-Successional Reserves, Riparian Reserves, Matrix which includes General Forest Management Areas and Connectivity/Diversity Blocks, and a variety of special purpose management areas such as special areas, recreation sites, wild and scenic rivers, and visual resource management areas. These land use allocations are located and configured in the landscape to support overall ecosystem function and to meet the vision for management of federal lands in western Oregon.

The major land use allocations are displayed on Map 2-3 and Figure S-1.

Each land use allocation will be managed according to specific objectives and management actions/ direction. During initial implementation of the plan, the stated objectives and management actions/ direction will provide the rules and limits governing actions and the principles specifying the environmental conditions or levels to be achieved and maintained. As BLM gains experience in implementing the plan and applying the concepts of adaptive management, the stated objectives and management actions/direction will be refined for specific geographic areas.

There are two major management concepts underlying the plan: Ecological Principles for Management of Late-Successional Forests, and the Aquatic Conservation Strategy.

Ecological Principles for Management of Late-Successional Forests

One goal of the plan is to maintain late-successional and old-growth species' habitat and ecosystems on federal lands. A second goal is to maintain biological diversity associated with native species and ecosystems in accordance with laws and regulations.

All land use allocations described in the plan will contribute to these two goals. For instance, Late-Successional and Riparian Reserves and many special management areas (e.g., areas of critical environmental concern) will be managed to enhance and/or maintain late-successional forest conditions. The General Forest Management Area and Connectivity/Diversity Blocks will be managed to retain late-successional forest legacies (e.g., coarse woody debris, green trees, snags, and late-successional forest patches).

Aquatic Conservation Strategy

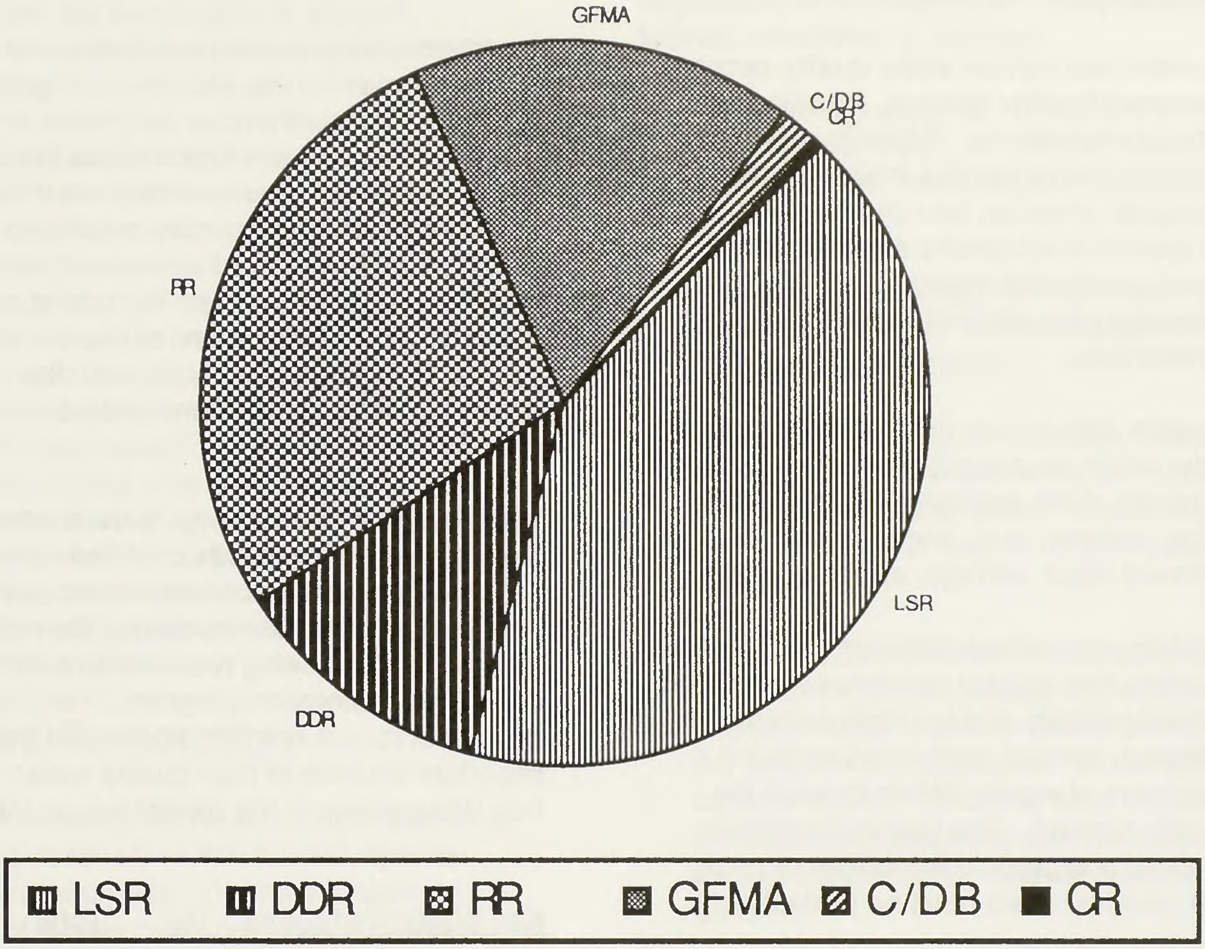
The Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The strategy would protect salmon and steelhead habitat on federal lands managed by the Forest Service and Bureau of Land Management within the range of the Pacific Ocean anadromy.

The Aquatic Conservation Strategy is designed to meet the following objectives:

- Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species' populations and communities are uniquely adapted.

- Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refuge. These lineages must provide chemically and physically unobstructed routes to areas critical for fulfilling life history

Figure S-1. Proposed Resource Management Plan Land Use Allocations



		Allocation[1]	Acres	Percent
CR	=	Congressional Reserves	600	0.2
LSR	=	Late-Successional Reserves	136,800	41.8
DDR	=	District Defined Reserves[2]	38,300	11.7
RR	=	Riparian Reserves	89,600	27.4
GFMA	=	General Forest Management Area	55,300	16.9
C/DB	=	Connectivity/Diversity Blocks	6,600	2.0
TOTAL			327,200	100.0

[1] Allocations do not have any overlapping designations.

[2] District Defined Reserves include areas designated for Special Management Areas, existing or potential recreation sites/areas. Nonforest Lands, TPCC Unavailable Lands, and Threatened and Endangered Species Habitat.

requirements of aquatic and riparian-dependent species.

- Maintain and restore the physical integrity of the aquatic system—including shorelines, banks, and bottom configurations.
- Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain in the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.
- Maintain and restore the sediment regime under which an aquatic ecosystem evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.
- Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing (i.e., movement of woody debris through the aquatic system). The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.
- Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.
- Maintain and restore the species' composition and the structural diversity of plant communities in riparian zones and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.
- Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

The components of the Aquatic Conservation Strategy are Riparian Reserves, Key Watersheds, watershed analysis, and watershed restoration.

Riparian Reserves

See Riparian Reserves in the following section.

Key Watersheds

A system of Key Watersheds that serve as refuge is crucial for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species. These refuge include areas of high quality habitat and areas of degraded habitat. Key Watersheds with high quality conditions will serve as anchors for the potential recovery of depressed stocks. Those of lower quality habitat have high potential for restoration and will become future sources of high quality habitat with the implementation of a comprehensive restoration program.

There are two types of Key Watersheds—Tier 1 and Tier 2. Tier 1 watersheds contribute directly to conservation of at-risk anadromous salmonids, bull trout, and resident fish species. They also have a high potential of being restored as part of a watershed restoration program. Tier 2 watersheds do not contain at-risk fish stocks, but they are important sources of high quality water.
Key Watersheds in the district are as follows:

Key Watershed Name	Tier	Acres Total	Acres BLM
Upper Smith River	1	5,000	3,200
North Fork Smith River	1	43,700	3,200
Upper Fiddle Creek	1	6,400	1,200
Wassen Creek	1	17,800	6,800
Franklin Creek	1	4,600	100
Paradise Creek	1	11,900	6,400
Tioga Creek	1	24,600	15,600
Upper North Fork Coquille River	1	5,400	4,100
North Fork Coquille, Cherry Creek	1	8,300	6,100
South Fork Coquille	1	22,800	8,400
Dry Creek	1	11,900	100
Elk River	1	20,400	700
North Fork Chetco	1	20,400	8,400

See Map 2-3 for the location of the Key Watersheds. There are no Tier 2 Watersheds in the District.

Key Watersheds overlay portions of all land use allocations in the district and place additional management requirements or emphasis on activities in those areas.

Watershed Analysis

Watershed analysis is one of the principle analyses that will be used to meet the ecosystem management objectives of this RMP. Watershed analyses will be the mechanism to support ecosystem management at approximately the 20- to 200-square-mile watershed level.

Watershed analysis will focus on collecting and compiling information within a watershed that is essential for making sound management decisions. It will be an analytical process, not a decision-making process with a proposed action requiring NEPA documentation. It will serve as a basis for developing project-specific proposals and for determining monitoring and restoration needs of a watershed. Project-specific NEPA planning will use information developed from watershed analysis. For example, if watershed analysis shows that restoring certain resources within a watershed could contribute to achieving Aquatic Conservation strategy objectives, then subsequent decisions will need to address that information.

Watershed Restoration

Watershed restoration will be an integral part of a program to aid recovery of fish habitat, riparian habitat, and water quality. The most important components of a watershed restoration program are control and prevention of road-related runoff and sediment production, restoration of the condition of riparian vegetation, and restoration of instream habitat complexity. Other restoration opportunities include meadow and wetland restoration and mine reclamation.

Riparian Reserves

Riparian Reserves support Aquatic Conservation Strategy objectives and provide habitat for special status and ROD special attention species.

There are approximately 203,200 acres of Riparian Reserves in the district. Calculation of these acres is based on prescribed widths and estimated miles of stream in the various categories described in the ROD. Riparian Reserves occur within all land use allocations. The widths are intended to provide a high level of fish, wildlife, and plant habitat and riparian protection until watershed and site analysis can be completed. Although Riparian Reserve boundaries on permanently-flowing streams may be adjusted, they are considered to be the approximate widths necessary for attaining Aquatic Conservation Strategy objectives.

Riparian Reserves consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance initially calculated as follows, whichever is greatest:

> *Fish-bearing streams*: Equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream channel).
>
> *Permanently-flowing, non-fish-bearing streams*: Equal to the height of one site-potential tree, or 150 feet slope distance.
>
> *Seasonally-flowing or intermittent streams, wetlands less than one acre, and unstable and potentially unstable areas*: Equal to the height of one site-potential tree, or 100 feet slope distance.
>
> In the last case and in the following ones, Riparian Reserves include the extent of unstable and potentially unstable areas, and the extent of the wetland or water body. In the following cases, Riparian Reserves also include the extent of seasonally-saturated soil and distances initially calculated as follows, whichever is greatest:
>
> *Constructed ponds and reservoirs, and wetlands greater than one acre*: Equal to the height of one site-potential tree, or to 150 feet slope distance from the edge of a wetland greater than one acre or the maximum pool elevation of constructed ponds and reservoirs.
>
> *Lakes and Natural Ponds*: Equal to the height of two site-potential trees, or 300 feet slope distance.

As a general rule, management actions/direction for Riparian Reserves prohibit or regulate activities that retard or prevent attainment of Aquatic Conservation Strategy objectives. Watershed analysis and appropriate National Environmental Policy Act compliance will be required to change Riparian Reserves in all watersheds.

Timber harvest—including fuelwood cutting—will be precluded in Riparian Reserves, except for the following: if salvage is required to attain Aquatic Conservation Strategy objectives after catastrophic events, when watershed analysis determines that present and future woody debris needs are met and other Aquatic Conservation Strategy objectives are not adversely affected, or where roadside trees need to be removed for safety.

Silvicultural practices will be applied in Riparian Reserves to control stocking, re-establish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives.

New roads in Riparian Reserves will be designed to meet Aquatic Conservation Strategy objectives.

Late-Successional Reserves

Late-Successional Reserves will be established to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth forest-related species including the northern spotted owl and marbled murrelet. Another reason for establishing Late-Successional Reserves is to maintain a functional, interacting, late-successional and old-growth forest ecosystem.

There are approximately 142,500 acres of Late-Successional Reserves in the district. The five components of this reserve system are:

1. Mapped Late-Successional Reserves: These reserves incorporate Key Watersheds to the extent practicable; some or parts of the most ecologically significant and ecologically significant late-successional forests identified by the Scientific Panel on Late-Successional Forest Ecosystems; and some or parts of the Designated Conservation Areas from the Final Draft Spotted Owl Recovery Plan.
2. Late-Successional/Old Growth 1 and 2 areas within Marbled Murrelet Zone 1, as mapped by the Scientific Panel on Late-Successional Forest Ecosystems.
3. Occupied Marbled Murrelet Sites.
4. Known Spotted Owl Activity Centers (as of January 1, 1994).
5. Protection Buffers for Special Status and ROD Special Attention Species.

See Map 2-3 for locations of Late-Successional Reserves. Occupied marbled murrelet sites, known spotted owl activity centers, and protection buffers are unmapped.

Silvicultural treatments that are beneficial to the creation of late-successional habitat will be conducted inside Late-Successional Reserves.

If needed to create and maintain late-successional forest conditions, thinning operations will be conducted in forest stands up to 80 years of age. This will be accomplished by precommercial or commercial thinning of stands regardless of origin (e.g., planted after logging or naturally regenerated after fire or blowdown).

Salvage of dead trees in Late-Successional Reserves will be limited to areas where stand-replacing events exceed ten acres in size and canopy closure has been reduced to less than 40 percent. All standing live trees will be retained—including those injured (e.g., scorched) but likely to survive, as well as snags that are likely to persist until late-successional forest conditions have developed and a new stand is again producing large snags.

Matrix (Connectivity/Diversity Blocks and General Forest Management Area)

The lands in the Matrix are expected to:

- Produce a sustainable supply of timber and other forest commodities.
- Provide connectivity (along with other allocations such as Riparian Reserves) between Late-Successional Reserves.
- Provide habitat for a variety of organisms associated with both late-successional and younger forests.
- Provide for important ecological functions such as dispersal of organisms; carryover of some species from one stand to the next; and maintenance of ecologically valuable structural components such as down logs, snags, and large trees.
- Provide early-successional habitat.

In the Matrix, there are approximately 55,300 acres of BLM-administered land in the General Forest Management Area and 6,600 acres in Connectivity/Diversity Blocks. Connectivity/Diversity Blocks vary in size and are distributed throughout the Matrix (see Map 2-3).

Timber harvest and other silvicultural activities will be conducted in that portion of the Matrix with suitable forest lands. Management direction is summarized in the Timber Resources section later in this summary.

Timber harvest will be conducted so as to provide a renewable supply of large down logs well distributed across the Matrix landscape in a manner that meets the needs of species and provides for ecological functions. Down logs will reflect the species mix of the original stand.

Green trees and snags will be retained throughout the General Forest Management Area, including 6 to 8 green conifer trees per acre in regeneration harvest units. Snags will be retained within a timber harvest unit at levels sufficient to support species of cavity-nesting birds at 40 percent of potential population levels. In addition, green trees will be retained for snag recruitment in timber harvest units where there is an identified, near-term (less than 3 decades) snag deficit. These trees do not count toward green-tree retention requirements.

Connectivity/Diversity Blocks will be spaced throughout the Matrix. They will be managed to maintain 25 to 30 percent of each block in late-successional forest at any point in time. Riparian Reserves and other allocations with late-successional forest count toward this percentage.

In fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest, all remaining late-successional forest stands will be retained.

Air Quality

Efforts to meet National Ambient Air Quality Standards, Prevention of Significant Deterioration goals, and the visibility protection plan will continue. Activities will be conducted so as to maintain and enhance air quality and visibility in a manner consistent with the Clean Air Act and the Oregon State Implementation Plan.

Smoke emissions will be controlled to meet State targets for reduction from historic levels. This will be accomplished by planning, conducting, monitoring, and—if necessary—adjusting prescribed fire activities in accordance with the State Implementation Plan and the Oregon Smoke Management Plan.

Methods for slash disposal and site preparation that reduce the need to burn will be developed and used. The selected methods will be compatible with ecosystem management objectives.

The potential for wildfire emissions will be reduced through the use of prescribed fire and other fuels management techniques.

Water and Soils

The Aquatic Conservation Strategy and Riparian Reserve management previously discussed are the main elements of water and soils management.

In addition, management will comply with state water quality requirements to restore and maintain recognized beneficial uses, and it will strive to improve and/or maintain soil productivity.

Soil and water conditions will be improved and/or maintained by closing selected areas to off-highway vehicle use and/or limiting such use to existing or designated roads and trails. See the Recreation section later in this summary for additional details.

BLM will continue to implement a nonpoint source management program in cooperation with the U. S. Environmental Protection Agency and the Oregon Department of Environmental Quality. Coordination will also continue with the Oregon Department of Environmental Quality for implementation of best management practices that protect beneficial uses of water.

Consistency of management activities with Oregon's *Statewide Water Quality Management Plan* for forest practices and with Oregon's water quality criteria and guidelines (Oregon Administrative Rule 340-41) will be ensured.

Flood plains and wetlands will be protected in accordance with Executive Orders 11988 and 11990 and BLM's *Riparian-Wetlands Initiative for the 1990s*.

Wildlife Habitat

Late-Successional Reserve, Riparian Reserve, and Matrix management all contribute to management of wildlife habitat. Management will be directed to enhance and maintain biological diversity and ecosystem health to contribute to healthy wildlife populations. Management for Special Status and ROD Special Attention Species Habitat (discussed later) also addresses many wildlife species.

Fish Habitat

The Aquatic Conservation Strategy directs fish habitat management. Riparian Reserve management is a key element of management intended to maintain or enhance the fisheries potential of streams and other waters consistent with BLM's Fish and Wildlife 2000 Plan, the Bring Back the Natives initiative, and other nationwide initiatives. This management is also intended to promote the rehabilitation and protection of fish stocks at risk and their habitat.

Priority for fish habitat enhancement projects will be given to watersheds supporting at-risk fish species and stocks and those requiring extensive restoration. Actions will be taken to rehabilitate streams and other waters to enhance natural populations of anadromous and resident fish. Possible rehabilitation measures would include—but not be limited to—fish passage improvements, instream structures using boulders and log placement to create spawning and rearing habitat, placement of fine and coarse materials for over-wintering habitat, and riparian rehabilitation to establish or release existing coniferous trees.

The combination of these measures will improve fish habitat on BLM-administered lands, but that improvement will occur slowly and continue for more than 100 years.

Special Status and ROD Special Attention Species Habitat

Management will be designed to protect, manage, and conserve federal listed and proposed species and their habitats to achieve their recovery in compliance with the Endangered Species Act, approved recovery plans, and Bureau special status species policies. Management for the conservation of federal candidate and Bureau sensitive species and their habitats will focus on actions that do not contribute to listing, but rather to the recovery of the species. Management for the conservation of state listed species and their habitats will be designed to assist the state in achieving management objectives.

Assessment species (which are of lesser concern) will be managed where possible so as to not elevate their status to any higher level of concern. ROD special attention species will also be managed so as not to elevate their status to any higher level of concern.

Community structure, species composition, and ecological processes of special status plant and animal habitat will be maintained or restored.

BLM will consult with or request technical assistance from the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) for any proposed action that may affect federal listed or proposed species or their critical or essential habitat. Based on the results of consultation, the proposed action will be modified, relocated, or abandoned.

Table S-3 shows the numbers of special status plant and animal species that have been identified as inhabiting BLM-administered lands in the planning area.

The survey and manage provision of the ROD will be implemented within the ranges of its special attention species and the particular habitats that they are known to occupy.

Protection buffers will be provided for specific rare and locally endemic species and ROD special attention species in the upland forest matrix.

Establishment of Late-Successional Reserves and other general allocations provide the framework for protection of the northern spotted owl. In addition, 100 acres of the best northern spotted owl habitat as close as possible to a nest site or owl activity center in the Matrix will be retained for all known (as of January 1, 1994) spotted owl activity centers. These allocations and ROD standards and guidelines are expected to achieve recovery of the northern spotted owl.

As noted previously, Late-Successional Reserves include Late-Successional/Old Growth 1 and 2 areas in marbled murrelet Zone 1 and all occupied murrelet sites. In addition, contiguous existing and recruitment habitat for marbled murrelets (i.e., stands that are capable of becoming marbled murrelet habitat within 25 years) within a 0.5-mile radius of any site where the birds' behavior indicates occupation will be protected. These allocations and ROD standards and guidelines provide a high likelihood of a marbled murrelet population well distributed on federal lands in the region.

Seven existing bald eagle nest sites would be protected to support the Pacific Bald Eagle Recovery Plan.

No peregrine falcon nest sites are known to exist on BLM-administered lands within the planning area.

Table S-3. Special Status Species Found on BLM-administered Lands

Status	Number of Plant Species	Number of Animal Species
Federal Threatened	0	5
Federal Endangered	0	2
Federal Proposed	0	0
Federal Candidate	7	16
State Listed	1	6
Bureau Sensitive	4	10

Potential cliff nest areas would be protected to maintain their potential as future nest sites.

Snowy plover sites at New River and on the North Spit of Coos Bay are currently protected. Designation and management of these two areas as ACECs would continue to provide protection for this species.

Special Areas

The existing New River ACEC and Cherry Creek Research Natural Areas would be retained. Nine additional areas would be designated as ACECs.

Cultural Resources Including American Indian Values

Cultural resource localities will continue to be identified and managed for public, scientific, and cultural heritage purposes.

Responsibilities to appropriate American Indian groups regarding heritage and religious concerns will be fulfilled.

Visual Resources

The 600 acres protected by Congressional designation would be managed for preservation of scenic quality. The 6,600 acres of other highly sensitive land (VRM Class II) adjacent to state and federal highways and within 0.25 mile of recreation sites would be managed so that landscape alterations caused by management would not attract attention and to retain scenic quality. An additional 14,700 acres of visually sensitive lands (VRM Class III) would be managed so that landscape alterations would not dominate the view and to partially retain scenic quality. Protection of lands in reserves and special management areas would retain scenic quality on much of the BLM-administered lands.

Wild and Scenic Rivers

No river segments would be found suitable for designation by Congress under the Wild and Scenic Rivers Act. The 184 miles of river found eligible for designation were studied by BLM and found to be not suitable for such designation.

Rural Interface Areas

VRM Class III management (and other special timber management practices) would be applied on 2,100 acres of BLM-administered lands within 0.25 mile of private lands where county zoning allows for development on 1- to 5-acre lots.

Socioeconomic Conditions

Management will contribute to local, state, national, and international economies through sustainable use of BLM-managed lands and resources and use of innovative contracting and other implementation strategies. It will also provide amenities (e.g., recreation facilities, protected special areas, and high quality fisheries) that enhance communities as places to live and work.

BLM management programs are expected, on the average, to support 774 jobs and provide $11.5 million a year in personal income during the life of the plan. Those jobs are 1,520 (66 percent) less than the average supported in the 1984-1988 baseline period.

The net decline in jobs cited above combines with an expected decline in jobs supported by U.S. Forest Service, private, and other timber supplies. This combined effect would lead to substantial job losses in some communities in the planning area with consequent adverse effects on community stability.

Jobs are also supported by downstream and offshore recreational and commercial fishing for fish supported by BLM habitat. However, fishing opportunities related to BLM management are not expected to change significantly in the next ten years, as the fish habitat improvement expected from the proposed plan will take place slowly and continue for more than 100 years.

Recreation

Management will aim to provide a wide range of developed and dispersed recreation opportunities that contribute to meeting projected recreation demand within the planning area in a manner consistent with BLM's Recreation 2000 Implementation Plan and Oregon-Washington Public Lands Recreation initiative. Scenic, natural, and cultural resources will be managed to enhance visitor recreation experience expectations and produce satisfied public land users. Locally-sponsored tourism initiatives and community economic strategies will be supported by providing recreation projects and programs that benefit both short- and long-term implementation.

The 12 existing recreation sites would remain open, and 12 additional sites would be constructed if funding is available. The emphasis of facility management and development would be placed on accommodating the increasing demand for recreation opportunities close to population centers and accessible by road.

Five road segments (both BLM roads and county roads) totaling 155 miles would be designated as Back Country Byways, components of the National Scenic Byway System.

Management of off-highway vehicles would include closing 3,000 acres year-round to vehicle uses to protect Research Natural Areas, Areas of Critical Environmental Concern, progeny test sites and seed orchards, and other sensitive areas. Use for administrative purposes and authorized removal of commercial commodities such as timber would be excepted. Off-highway vehicle use would be limited to designated roads throughout most of the district (approximately 326,600 acres).

While use for all recreation activities is expected to increase during the life of the RMP, the expected demand would be met for all activities.

Additional emphasis would be placed on interpretive and informational signing and maps to support both state and local strategies for encouraging tourism.

Timber Resources

Management will provide a sustainable supply of timber and other forest products.

Lands available for scheduled timber harvest are as follows:

Land Use Allocation	Approx. Acres
General Forest Management Areas (including visual resource management class II, rural interface, and TPCC restricted)	55,300
Connectivity/Diversity Blocks	6,600

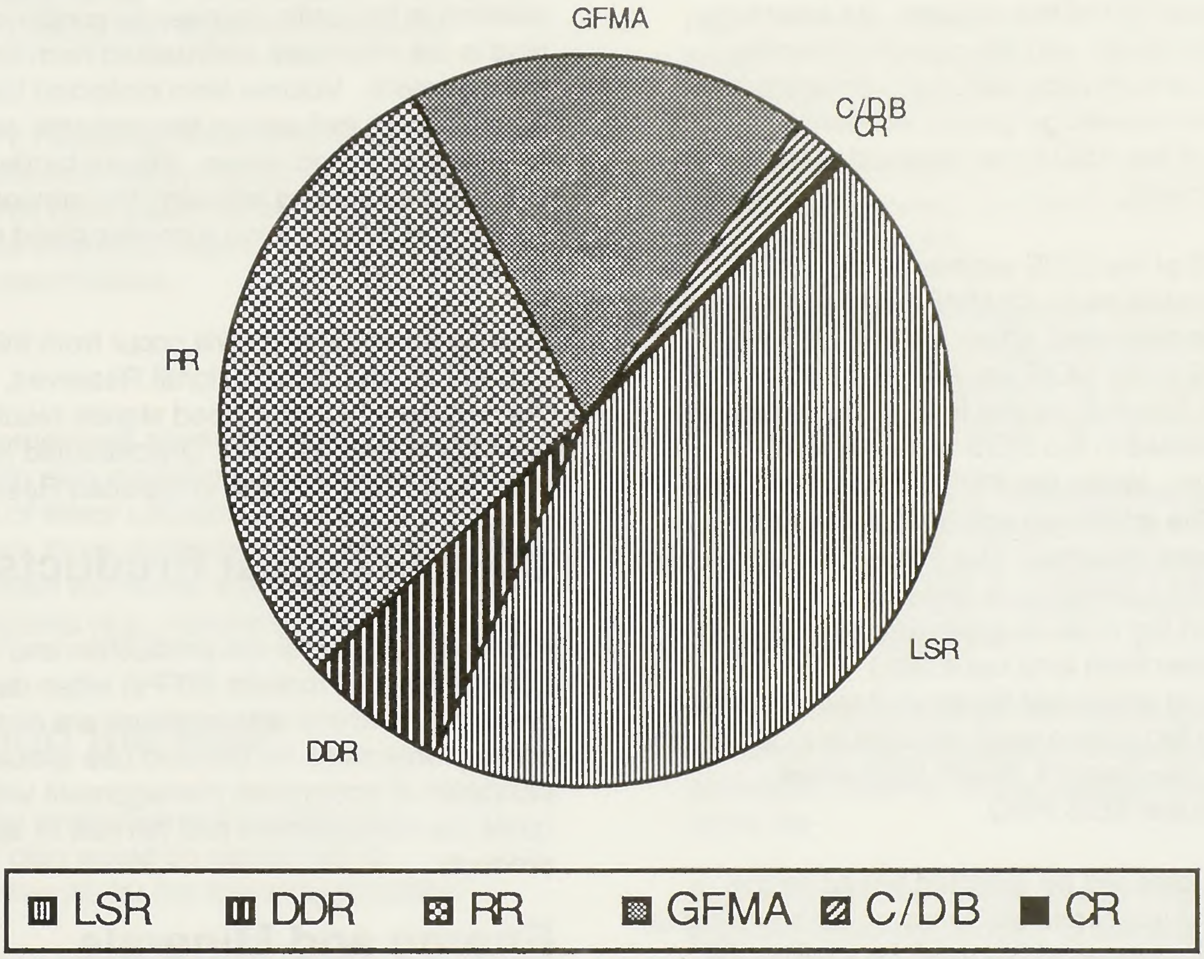
The allocation of lands available for scheduled harvest is shown in Figure S-2.

The annual Probable Sale Quantity (PSQ) from these allocations and the management planned for the Matrix is 5.3 million cubic feet (32 million board feet). The PSQ is based on coniferous volume only.

The Probable Sale Quantity (PSQ) for the PRMP is an estimate of annual average timber sale volume likely to be achieved from lands allocated to planned, sustainable harvest. The use of PSQ— rather than "Allowable Sale Quantity" (ASQ) recognizes uncertainties in the estimate. Harvest of this approximate volume of timber is considered sustainable over the long term based on the assumptions that the available land base remains fixed, and that funding is sufficient to make planned investments in timely reforestation, plantation maintenance, thinning, genetic selection, forest fertilization, timber sale planning, related forest resource protection, and monitoring.

The PSQ represents neither a minimum level that must be met nor a maximum level that cannot be exceeded. It is an approximation because of the difficulty associated with predicting actual timber sale levels over the next decade, given the complex nature of many of the standards and guidelines. It represents BLM's best assessment of the average amount of timber likely to be awarded annually in the planning area over the life of the plan, following a

Figure S-2. Proposed Resource Management Plan Net Commercial Forest Land Allocations



		Allocation[1]	Acres	Percent
CR	=	Congressional Reserves	600	0.2
LSR	=	Late-Successional Reserves	136,800	44.2
DDR	=	District Defined Reserves[2]	20,400	6.6
RR	=	Riparian Reserves	89,600	29.0
GFMA	=	General Forest Management Area	55,300	17.9
C/DB	=	Connectivity/Diversity Blocks	6,600	2.1
TOTAL			309,300	100.0

[1] Allocations do not have any overlapping designations.

[2] District Defined Reserves include areas designated for Special Management Areas, Existing or Potential Recreation Sites/Areas, TPCC Unavailable Lands, and Threatened and Endangered Species Habitat.

start-up period. The actual sustainable timber sale level attributable to the land-use allocations and management direction of the PRMP may deviate by as much as 20 percent from the identified PSQ. The potential variables are discussed in the Timber Resources section of this chapter. As inventory, watershed analysis, and site-specific planning proceed in conformance with that management direction, the knowledge gained will permit refinement of the ASQ to be declared when a plan decision is made.

Alternative 9 of the SEIS estimated the PSQ for the Coos Bay District to be 43 MMBF long log scale. Although the proposed action in the PRMP and Alternative 9 in the SEIS are almost identical, the acreages of intermittent and first and second order streams included in the SEIS were not fully accounted for. When the PSQ for the PRMP was computed, the additional acreages of Riparian Reserves were included. The PSQ—as displayed in the PRMP (32.1 MMBF)—is based on short log scale. (Short log scale is approximately 18 to 20 percent greater than long log scale.) The combination of additional Riparian Reserves and difference in log scales used resulted in a 38 percent reduction in the district's PRMP PSQ when compared to the SEIS PSQ.

Logging systems will be selected based on the suitability and economic efficiency of each system for the successful implementation of the silvicultural prescription, for protection of soil and water quality, and for meeting other land use objectives.

Regeneration harvests will be scheduled to assure that, over time, harvest would occur in stands at or above the age of volume growth culmination (i.e., culmination of mean annual increment). This refers to the age range that produces maximum average annual growth over the lifetime of a timber stand. In the planning area, culmination occurs between 60 and 80 years of age. During the first decade, regeneration harvests may be scheduled in stands as young as 60 years to develop a desired age class distribution across the landscape.

Silvicultural treatments and harvest designs will be based on the functional characteristics of the ecosystem and on the characteristics of each forest stand and site. Treatments would be designed, as much as possible, to prevent the development of undesirable species composition, species dominance, or other undesirable stand characteristics. The principles of integrated pest management and integrated vegetation management would be employed to avoid the need for direct treatments. Herbicides would be used only as a last resort.

Harvest of marketable hardwood stands will be planned in the same manner as conifer stands, if the land is not otherwise constrained from timber management. Volume from projected hardwood harvest is not included in the probable sale quantity estimate displayed above. Where hardwood trees became established following the previous harvest of conifers, re-establishing a conifer stand on the site will be planned.

Unscheduled harvests will occur from thinning and salvage in Late-Successional Reserves, and from the conversion of hardwood stands resulting from previous human activity. Unscheduled harvests may also occur from salvage in Riparian Reserves.

Special Forest Products

BLM will manage for the production and sale of Special Forest Products (SFPs) when demand is present and where actions taken are consistent with primary objectives for the land use allocation. The principles of ecosystem management will be used to guide the management and harvest of special forest products.

Energy and Minerals

Management will maintain exploration and development opportunities for leasable and locatable energy and mineral resources.

Most BLM-administered lands would remain available for mineral leasing of oil and gas or geothermal resources and location of mining claims, but a variety of designations and allocations such as Areas of Critical Environmental Concern, Late-Successional Reserves, and Riparian Reserves restrict exploration and development.

Land Tenure Adjustments

Land tenure adjustments would benefit a variety of uses and values, emphasizing opportunities that conserve biological diversity or enhance timber management opportunities. As a matter of practice, O&C forest lands allocated to timber management would only be exchanged for lands to be managed for multiple-use purposes.

Lands are categorized in three land tenure adjustment zones:

- **Zone 1:** 4,600 acres retained under BLM administration.
- **Zone 2:** 324,000 acres where land ownership may be "blocked up" in exchange for other lands in Zones 1 and 2 with significant resource values.
- **Zone 3:** 1,100 acres where only lands with unique resource values would be retained; other lands in this zone would be exchanged, sold, or transferred to another agency using appropriate disposal mechanisms.

Roads

Road management will attempt to correct problems associated with high road density by emphasizing the reduction of minor collector and local road densities where those problems exist. Roads will be managed to meet the needs identified under other resource programs (e.g., seasonal road closures for wildlife).

Monitoring the RMP

Monitoring and evaluation of the resource management plan would be carried out at appropriate intervals for the following purposes:

- To be sure activities are occurring in conformance with the RMP.
- To determine if activities are producing the expected results.
- To determine if activities are causing the effects identified in the environmental impact statement.

Consistency with State, Local, Tribal and Other Federal Plans

BLM planning regulations require that resource management plans be consistent with officially approved or adopted resource-related plans, and the policies and procedures therein, of the federal agencies, state and local governments, and Indian tribes, so long as the RMPs are also consistent with applicable federal laws and regulations. The BLM has compared the PRMP with a variety of such plans of other agencies. The PRMP appears to be consistent with all such plans, policies, and procedures, except perhaps the following:

- Possible cumulative effects of BLM and other landowners' activities in some watershed could lead to violation of the State of Oregon's antidegradation policy.
- Possible inconsistency with Oregon's Statutory Wildlife Policy by maintaining some wildlife populations at less than optimum.
- Possible inconsistency with the clearcut size and proximity requirement of Section 4 of the Oregon Forest Practices Act.
- Possible delay in reforestation beyond the one year required by the Oregon Forest Practices Act, due to the requirement for smoke management clearance before burning slash.
- Inconsistency with the Natural Heritage Program administered by the Oregon Division of State Lands, due to proposed designation of only some of the potential Research Natural Areas identified in that program.
- Probable inconsistency with the Oregon Benchmarks for increasing standard of living, affordable housing, family stability, and stable home life.
- Partial inconsistency with Oregon statewide planning Goal 9 (Economy of the State), due to reduced levels of BLM-resource-dependent employment and payments to counties.

Public Involvement

Public involvement has been an integral part of BLM's resource management planning effort. Activities have included mailers or brochures, public meetings, open houses, distribution of planning documents and related comment periods, informal contacts, group meetings, written letters, and responses to comments.

Mailers requested comments on issue identification, development of planning criteria contained in State Director guidance for the process, and BLM's analysis of the management situation which set the baseline for development of the draft RMP/EIS. Suggestions for formulation of the preferred alternative were also requested.

The draft RMP/EIS was released for public review and comment in 1992. Comments were evaluated and some substantive recommendations led to changes in the Proposed RMP or the analysis of

Table S-1. Major Land Use or Resource Allocations and Planned and Assumed Actions on BLM-Administered Lands, by Alternative

	PRMP	NA
Water Quality and Riparian Zones		
Riparian Management Area (RMA) Protection (average width in feet each side of stream)		
Stream Order 1	[1]	
Stream Order 2		
Stream Order 3		80
Stream Order 4		90
Stream Order 5		115
Stream Order 6+		125-200
Lakes, ponds, and other waters		
Riparian Reserves (acres)	203,200 [2]	
RMA (acres)		10,800
Areas excluded from harvest or other ground-disturbing activities (acres) (FGR-2)	0	0

A	B	C	D	E
				50
			60	60
75	75	105	140	140
75	100	150	200	200
75	140	210	280	280
75	160	240	320	320
75	100	150	200	200
13,700	17,800	25,000	42,800	61,700
0	0	0	0	87,200

Table S-1. Major Land Use or Resource Allocations and Planned and Assumed Actions on BLM-Administered Lands, by Alternative (continued)

	PRMP	NA
Old-growth and Mature Forest Habitat		
Management Direction	Manage based on Ecological principles for management of Late-Successional forests. Manage 43 percent of the land as Late-Successional Reserves and 2 percent as Connectivity/ Diversity Blocks.	
Areas managed for retention and development of older forest (acres)	142,500	58,200
Area managed for maintenance of older forest characteristics (acres)	6,600	0
Older forests (mature and old-growth)	114,000	114,000
Retained at end of decade	114,000	83,000
Retained at end of 100 years	263,000	77,000

A	B	C	D	E
	Contribute to habitat diversity and old growth in a corridor system with blocks of 640 acres connected by 80-acre stepping stone blocks.	Manage for retention and improvement of biological diversity maintaining 17 percent of the land in restoration and retention blocks.	Manage as recommended by the 1990 Conservation Strategy for the northern spotted owl.	Contribute to habitat diversity by protecting existing stands over 150 years old, suitable spotted owl habitat within two miles of each spotted owl site, and additional habitat to benefit amphibians and pileated woodpeckers.
43,900	66,500	96,400	148,800	200,200
0	0	212,500	0	0
114,000	114,000	114,000	114,000	114,000
68,000	69,000	107,000	110,000	108,000
36,000	57,000	232,000	142,000	179,000

Table S-1. Major Land Use or Resource Allocations and Planned and Assumed Actions on BLM-Administered Lands, by Alternative (continued)

	PRMP	NA
Timber		
Forest Management Allocations (acres):		
Intensive Forest Management	55,300	243,300
Restricted	6,600	4,300
Enhancement of Other Uses or Not Available	247,400	57,000
Practices (assumed average annual acres for first decade):		
Regeneration Harvest	580	3,730
Commercial thinning/ density management harvest	610	730
Site Preparation Prescribed Fire	760	3,820
Other Stand Maintenance/ Protection	6,400	5,260
Release/Precommercial Thinning	3,480	4,080
Brushfield/Hardwood Conversion	120	590
Planting		
Regular Stock	220	420
Genetically-selected Stock	540	3,770
Fertilization	1,200	4,800
Pruning	870	0
New road construction		
Miles	18.6	16.6
Acres	100	90
Probable Sale Quantity (MMCF)	5.3	40.1
Probable Sale Quantity (MMBF)	32	254

A	B	C	D	E
265,000	241,800	0	0	83,100
0	600	212,500	160,100	25,600
43,900	66,500	96,400	148,800	200,200
5,150	5,000	1,350	1,150	1,260
1,250	460	700	1,030	210
4,960	4,750	1,400	1,320	1,220
5,210	5,070	4,610	4,740	4,450
970	470	880	210	290
790	1,040	520	820	240
970	810	770	0	0
4,500	4,440	770	1,430	1,340
7,920	6,990	4,730	3,350	2,590
0	0	0	0	0
24.5	22.3	13.2	16.4	12.4
130	120	70	90	70
46.2	41.9	14.0	13.5	10.7
294	267	86	76	65

Table S-1. Major Land Use or Resource Allocations and Planned and Assumed Actions on BLM-Administered Lands, by Alternative (continued)

	PRMP	NA
Special Status Species including Threatened and Endangered Species Habitat		
Management Direction	Manage habitats of Federal candidate, State listed, and Bureau sensitive species on all BLM-Administered lands.	
Areas managed so as not to contribute to need to list	329,600	N/A
Wildlife (including Fisheries) Habitat		
Buffer width, special habitats (feet)	100-300	0
Fish habitat improvement (miles)	40	20

A	B	C	D	E
Protect habitats of Federal candidate, State listed, and Bureau sensitive species where such mitigation would not diminish commercial use.	Same as A, plus protect those habitats on public domain lands.	Same as B, plus additional protection provided by management for older forests.	Protect habitats of Federal candidate, State listed, and Bureau sensitive species on all BLM-Administered lands.	Same as D.
64,600	124,300	149,600	329,600	329,600
0	0	100	100-200	100-300
20	20	20	20	20

Table S-1. Major Land Use or Resource Allocations and Planned and Assumed Actions on BLM-Administered Lands, by Alternative (continued)

	PRMP	NA
Special Areas		
Existing RNA/ACECs retained		
Number	1	1
Acres	570	570
Other Existing ACECs retained		
Number	1	1
Acres	880	880
New RNA/ACECs designated		
Number	0	0
Acres	0	0
Other New ACECs designated		
Number	9	0
Acres	7,950	0
Environmental Education Areas		
Number	1	1
Acres	70	70
Total RNA/ACECs		
Number	1	1
Acres	570	570
Total other ACECs		
Number	10	1
Acres	8,830	8,830

A	B	C	D	E
1	1	1	1	1
570	570	570	570	570
1	1	1	1	1
880	880	880	880	880
0	2	4	5	0
0	2,300	6,340	6,800	0
0	2	2	4	9
0	690	690	1,150	7,950
0	0	1	1	1
0	0	70	70	70
1	3	5	6	1
570	2,870	6,910	7,370	570
1	3	3	5	10
880	1,570	1,570	2,030	8,830

Table S-1. Major Land Use or Resource Allocations and Planned and Assumed Actions on BLM-Administered Lands, by Alternative (continued)

	PRMP	NA
Recreation Resources		
Recreation Sites		
Existing		
Number of sites	12	10
Acres	1,655	600
New		
Number of sites	12	1
Acres	410	200
County Parks on BLM-Administered land		
Number of sites	6	6
Acres	650	650
Trails maintained		
Existing		
Number of trails	4	2
Miles	4	0.5
New		
Number of trails	8	0
Miles	38-52	0
Special Recreation Management Areas (SRMAs)		
Existing		
Number of SRMAs	4	0
Acres	3,700	0
New		
Number of SRMAs	3	0
Acres	25,700	0
Back Country Byways		
Number of roads	5	0
Miles	155	0
Acres open to OHV use	80	264,600
Acres OHV limited to Designated Roads and Trails	326,600	58,400
Acres closed to OHV use	3,000	6,600
Miles of Road Open	830-1,360	1,390
Miles of Road Closed	205-735	170

A	B	C	D	E
5	10	11	11	11
1,410	1,610	1,650	1,650	1,650
0	3	9	22	22
800	120	370	580	580
6	6	6	6	6
650	650	650	650	650
2	2	2	2	2
0.5	0.5	0.5	0.5	0.5
0	3	7	11	11
0	11	36.25	43	43
3	3	3	3	3
2,040	2,040	2,040	2,040	2,040
0	2	2	3	3
0	1,680	2,490	2,690	2,690
0	0	5	5	5
0	0	155	155	155
0	0	0	0	0
327,200	324,900	320,800	320,800	327,200
2,400	4,700	8,800	8,800	2,400
1,565	1,565	1,040	785	525
0	0	525	780	1,040

Table S-1. Major Land Use or Resource Allocations and Planned and Assumed Actions on BLM-Administered Lands, by Alternative (continued)

	PRMP	NA
Wild and Scenic Rivers		
River segments found suitable for designation as:		
Recreational		
Number of segments	0	0
Miles	0	0
Scenic		
Number of segments	0	0
Miles	0	0
Wild		
Number of segments	0	0
Miles	0	0
Visual Resources		
Management Direction	Manage available forest land as inventoried within 0.25 mile of recreation sites, State and Federal highways. Manage other available forest land as VRM Class IV. Manage all other land as inventoried.	
Acres managed as VRM Class I	600	600
Acres managed as VRM Class II	6,600	4,300
Acres managed as VRM Class III	14,700	1,000
Acres managed as VRM Class IV	307,700	323,700

A	B	C	D	E
0	0	0	0	8
0	0	0	0	175
0	0	1	1	1
0	0	9.5	9.5	9.5
0	0	0	0	0
0	0	0	0	0
Manage available forest lands as VRM Class IV and all other land as inventoried.	Manage available forest land as inventoried within 0.25 mile of recreation sites, State and Federal highways, and designated rivers. Manage other available forest land as VRM Class IV. Manage all other lands as inventoried.	Same as A, except on available forest land where BLM-Administered land is more than half of the viewshed, manage as inventoried.	Manage all lands as inventoried.	Same as D, except manage as VRM Class III all lands inventoried as Class IV; and manage as Class I all lands within 0.25 mile of recreation sites, State and Federal highways, and designated rivers.
600	600	600	600	6,700
4,000	6,500	8,700	14,600	53,000
8,600	16,500	34,800	62,800	269,900
316,400	306,000	285,500	251,600	0

Table S-1. Major Land Use or Resource Allocations and Planned and Assumed Actions on BLM-Administered Lands, by Alternative (continued)

	PRMP	NA
Land Tenure		
Management Direction	Make exchanges within zones 2 and 3 that would enhance management opportunities to benefit one or more resource values. Sell PD lands and O&C or CBWR lands in zones that meet criteria of FLPMA Sec. 203(a). Consider R&PP leases to provide public facilities or services.	
Acres identified for retention (Zone 1)	4,600	N/A
Acres potentially eligible for exchange only (Zone 2)	324,000	N/A
Acres potentially eligible for sale or exchange (Zone 3)	1,100	N/A

A	B	C	D	E
Make exchanges to enhance non-declining timber harvest on BLM-Administered land. Sell or lease no commercial timberland.	Make exchanges of O&C and CBWR lands emphasizing opportunities primarily to enhance timber management opportunities. Sell PD lands and O&C lands other than available commercial forest land, meeting criteria of FLPMA Sec. 203(a). Make leases to accommodate other appropriate uses.	Same as B, except also make exchanges to contribute to conservation of biological diversity.	Emphasize exchanges to acquire lands with nontimber values. Sell lands other than available commercial forest lands, meeting criteria (1) or (2) of FLPMA Sec. 203(a). Lease only under the R&PP Act.	Same as D.
4,600	4,600	4,600	4,600	4,600
323,970	323,970	323,970	323,970	323,970
1,030	1,030	1,030	1,030	1,030

Table S-1. Major Land Use or Resource Allocations and Planned and Assumed Actions on BLM-Administered Lands, by Alternative (continued)

	PRMP	NA
Rights-of-Way		
Rights-of-Way Avoidance Areas (acres) [3]	146,700	1,600
Rights-of-Way Exclusion Areas (acres)	600	600
Energy and Minerals Management		
Acres available for oil and gas and geothermal leasing	328,000	327,400
Acres closed to oil and gas and geothermal leasing	1,600	1,600
Acres open to mining claim location and operation	317,100	321,900
Acres closed to mining location	12,500	7,100
Rural Interface Area Management		
Acres considered for alternative management practices	2,100	0
Acres where clearcutting, aerial herbicide, and prescribed burning excluded	0	0
Acres managed for VRM Class II objectives	0	0
Acres managed for VRM Class III objectives	2,100	0

---

[1] Perennial and intermittent streams and other waters would be allocated as Riparian Reserves with varying widths. See Chapter 2, Riparian.

[2] Riparian Reserves occur within all other allocations.

[3] Does not include threatened and endangered species habitat, which would also be right-of-way avoidance areas.

A	B	C	D	E
200	2,600	6,100	6,700	9,800
600	2,900	6,900	6,900	6,700
327,400	327,400	327,400	327,400	327,400
1,600	1,600	1,600	1,600	1,600
322,200	319,900	315,800	315,800	322,200
6,800	9,100	13,200	13,200	6,800
0	2,100	2,100	2,100	6,700
0	0	0	2,100	6,700
0	0	0	2,100	6,700
0	2,100	2,100	0	0

Table S-2. Summary of Environmental Consequences, Comparison of Alternatives

	Allocation/Management Actions by Alternative						
Effects	PRMP[1]	NA[2]	A	B	C	D	E
Air Quality (tons of fuel burned[3] annually in prescribed fires, 1,000 tons) (1976-1979 Baseline 121,600)	21.2	111.1	144.2	144.5	34.9	37.7	36.0
Water Quality (10 years)[4]							
No. of watersheds probably improving[5]	5	n/a	1	2	3	5	4
No. of watersheds probably declining	0	n/a	4	4	2	2	2
Biological Diversity							
After 10 years (1,000 acres)							
mature forest (Existing 66)	59	43	65	51	55	56	52
old-growth forest (Existing 48)	55	40	3	18	52	54	56
After 100 years (1,000 acres)							
mature forest	164	16	22	28	167	71	98
old-growth forest	99	61	14	29	65	71	81
Riparian Trend (200 years: +, -, 0)	+	+	-	+	+	+	+
Dominant Woodpecker Populations (% of potential, 10 years)	65	57	52	53	64	65	63
Elk Habitat (10 years)[6]							
No. of watersheds improving	4	0	3	6	4	6	7
No. of watersheds unchanged	1	7	0	1	1	0	0
No. of watersheds declining	2	0	4	0	2	1	0

Table S-2. Summary of Environmental Consequences, Comparison of Alternatives (continued)

	Allocation/Management Actions by Alternative						
Effects	**PRMP**[1]	**NA**[2]	**A**	**B**	**C**	**D**	**E**
Threatened and Endangered Species							
Northern Spotted Owl Suitable Habitat Acres BLM-administered land (1,000 acres)							
After 10 years (Existing 117)	112	n/a	73	80	107	112	114
After 100 years	260	n/a	41	65	252	147	193
Marbled Murrelet Habitat Acres BLM-administered lands (1,000 acres) (Existing 100)							
After 10 years	96	n/a	62	69	92	93	95
After 100 years	265	n/a	12	15	60	113	217
Bald eagle nest sites protected	7	7	7	7	7	7	7
Potential Snowy Plover Habitat	+	0	0	0	+	+	+
Visual Resources (10 years; +, -, 0)	+	0	-	-	+	0	-
Wild and Scenic Rivers (study river segments, 10 years)							
Number with outstandingly remarkable values (ORVs) beneficially affected	0	0	0	0	1	1	2
Number with ORVs unaffected	7	6	6	6	6	6	5
Number with ORVs adversely affected	0	1	1	1	0	0	0
Recreation Use (capability to meet 10-year demand (Yes, No)							
Off-highway travel	Yes	Yes	Yes	Yes	Yes	No	No
Motorized travel	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nonmotorized travel	Yes	No	No	No	Yes	Yes	Yes
Camping	Yes	No	No	No	No	Yes	Yes
Hunting	Yes	Yes	Yes	Yes	Yes	Yes	No
Picnicking, studying nature, etc.	Yes	No	No	No	Yes	Yes	Yes
Fishing	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table S-2. Summary of Environmental Consequences, Comparison of Alternatives (continued)

	Allocation/Management Actions by Alternative						
Effects	PRMP [1]	NA [2]	A	B	C	D	E
Boating	Yes	No	No	No	No	Yes	Yes
Swimming, general waterplay	Yes	Yes	No	No	Yes	Yes	Yes
Winter sports	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Socioeconomic Conditions (10 years)							
Planning area jobs dependent on BLM Resources (Baseline 2,294)	774	2,499	2,832	2,641	1,165	1,148	983
Planning area annual personal income dependent on BLM Resources ($ million) (Baseline 47.5)	11.5	48.2	55.0	50.6	19.9	19.5	16.2
Average annual Western Oregon O&C receipts distributed to counties ($ million) (Baseline 63.4)	25.8	130.0	169.4	154.2	48.1	54.1	39.7

---

[1] PRMP = Proposed Resource Management Plan

[2] NA = No Action Alternative

[3] Tons of slash burned correlates directly with the level of emissions.

[4] Cumulative effects, all ownerships.

[5] The planning area was divided into 28 analytical watersheds. Seven of those, where BLM administers substantial acreage, were analyzed.

[6] The planning area was divided into 7 elk habitat areas where BLM administers substantial acreage.

Abbreviations used in this table:
n/a = Not Available
0 = No Change
- = Declining
+ = Improving

Acronyms/Abbreviations

ACE - Allowable Cut Effect
ACEC - Area of Critical Environmental Concern
ADS - Automated Digitized System
ACMP - Area of Critical Mineral Potential
AMS - Analysis of the Management Situation
APD - Application for Permit to Drill
ARD - Automated Resource Data
ARPA - Archeological Resources Protection Act
AS - Assessment Species
ASQ - Allowable Sale Quantity
ATV - All Terrain Vehicles
AUM - Animal unit month
AWS - Analytical Watershed
BFC - Billion feet cubic
BIA - Bureau of Indian Affairs
BLM - Bureau of Land Management
BMP - Best Management Practice
BRU - Basic Resource Unit
CBWR - Coos Bay Wagon Road
CEQ - Council of Environmental Quality
CFL - Commercial Forest Lands
CFR - Code of Federal Regulations
CMAI - Culmination of Mean Annual Increment
COE - Corps of Engineers
COPE - Coastal Oregon Productivity Enhancement
CRMP - Coordinated Research Management Program
CT - Commercial thinning

DBH - Diameter at breast height

DEIS - Draft Environmental Impact Statement

DEQ - Department of Environmental Quality

EA - Environmental Assessment

EEA - Environmental Education Area

EIS - Environmental Impact Statement

EO - Executive Order

EPA - Environmental Protection Agency

EQC - (Oregon) Environmental Quality Commission

ERMA - Extensive Recreation Management Area

ESA - Endangered Species Act

ESC - Existing Stand Condition

FC - Federal Candidate

FE - Federal Endangered

FEIS - Final Environmental Impact Statement

FEMAT - Forest Ecosystem Management Team

FERC - Federal Energy Regulatory Commission

FGR - Fragile Gradient Restricted

FGNW - Fragile Gradient Nonsuitable Woodland

FLPMA - Federal Land Policy and Management Act

FPFO - Forestry Program for Oregon

FPHT - Forest Products Harvest Tax

FT - Federal Threatened

GIS - Geographic Information System

GFMA - General Forest Management Area

GRU - Group Resource Unit

HCA - Habitat Conservation Areas

HMP - Habitat Management Plan

IDT - Interdisciplinary team

ISC	-	Interagency Scientific Committee
LEIS	-	Legislative Impact Statement
LSR	-	Late-Successional Reserve
LTSY	-	Long-Term Sustained Yield
MBF	-	Thousand Board Feet
MFP	-	Management Framework Plan
MI	-	Management Intensity
MMBF	-	Million board feet
MMCF	-	Million cubic feet
MOSS	-	Map Overlay and Statistical System
MOU	-	Memorandum of Understanding
MTP	-	Master Title Plat
NA	-	No Action
NAAQS	-	National Ambient Air Quality Standards
NEPA	-	National Environmental Policy Act
NPS	-	Non-point source
NPV	-	Net Present Value
NSO	-	Northern Spotted Owl (as used in the Special Status Species sections)
NSO	-	No Surface Occupancy (as used in the Minerals section)
NWSRS	-	National Wild & Scenic River System
O&C	-	Oregon and California Revested Lands
OAR	-	Oregon Administrative Rule
ODEQ	-	Oregon Department of Environmental Quality
ODF	-	Oregon Department of Forestry
ODFW	-	Oregon Department of Fish and Wildlife
OEDD	-	Oregon Economic Development Department
OFPA	-	Oregon Forest Practices Act
OHV	-	Off-highway vehicle
OI	-	Operations Inventory

ONA - Outstanding Natural Area

ORS - Oregon Revised Statutes

ORV - Outstandingly remarkable value (as used in Wild and Scenic Rivers section)

OSMP - Oregon Smoke Management Plan

OSPRD - Oregon State Parks and Recreation Department

PCT - Precommercial thinning

PD - Public domain

PILT - Payment in Lieu of Taxes

PL - Public Law

PLO - Public Land Order

PM - Particulate matter

PNW - Pacific Northwest

PNWW - Pacific Northwest-Westside

PPM - Parts per million

PRMP - Proposed Resource Management Plan

PSC - Power Site Reserve

PSQ - Probable Sale Quantity

RFD - Reasonably Foreseeable Development

RIA - Rural interface area

RMA - Riparian Management area

RMP - Resource Management Plan

RNA - Research Natural Area

ROD - Record of Decision

R&PP - Recreation and Public Purposes Act

R&R - Restoration and Retention (blocks)

SCFL - Suitable Commercial Forest Land

SCORP - Statewide Comprehensive Outdoor Recreation Plan

SCS - Soil Conservation Service

SE - State endangered

SEIS	-	Supplemental Environmental Impact Statement
SHPO	-	State Historic Preservation Officer
SIP	-	State Implementation Plan
SO	-	Secretarial Order
SPS	-	Stand Projection System
SRMA	-	Special Recreation Management Area
STEP	-	Salmon Trout Enhancement Program
SWL	-	Suitable Woodland (TPCC category)
SYU	-	Sustained Yield Unit
TAMM	-	Timber Assessment Market Model
T&E	-	Threatened and Endangered (species)
TMDL	-	Total Maximum Daily Loads
TPCC	-	Timber Production Capability Classification
USCG	-	United States Coast Guard
USFS	-	U.S. Forest Service
USFWS	-	U.S. Fish and Wildlife Service
USDA	-	United States Department of Agriculture
USDE	-	United States Department of Energy
USDI	-	United States Department of the Interior
VRM	-	Visual Resource Management
WCI	-	Watershed Condition Index
W&SR	-	Wild and Scenic River
WODDB	-	Western Oregon Digital Data Base
WPD	-	Water Power Designation
WSA	-	Wilderness Study Area

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Chapter 1
Introduction

Summary of Major Changes

- Terminology has been changed to reflect this is the Proposed Resource Management Plan/Final Environmental Impact Statement.
- All maps in the Proposed Resource Management Plan/Final Environmental Impact Statement are included in the map package.
- Table 1-1 has been updated to reflect more recent (March 1994) data.
- The numbering system for all appendices has been changed from the Draft Resource Management Plan/ Environmental Impact Statement. All appendices are included in Volumes 2 and 3.
- A discussion has been included on the relationship of the Resource Management Plan to the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Related Species Within the Range of the Northern Spotted Owl* and the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl.*

The Planning Area

The Coos Bay District Proposed Resource Management Plan/Final Environmental Impact Statement (PRMP/FEIS) analyzes impacts associated with managing 329,679 acres of land in Oregon administered by the U.S. Department of the Interior, Bureau of Land Management (BLM) Coos Bay District. Within the planning area there are also 12,152 acres of non-federal land with federal subsurface mineral estate administered by BLM.

Table 1-1 summarizes BLM-administered land in the planning area by county.

The land is located in western Oregon as shown on Map 1-1. Land status is shown on Map 1-2. BLM-administered lands are in the portions of the planning area located in the western slopes of the Oregon Coast Range. They are predominately forested with stands of Douglas-fir and drain into a number of different coastal rivers. Population is centered in and near Reedsport, Elkton, Coos Bay/North Bend, Coquille, Myrtle Point, Powers, Bandon, Port Orford, Gold Beach and Brookings.

Purpose and Need

As discussed in the *Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl* (hereafter referred to as the SEIS), the PRMP

Table 1-1. BLM-Administered Land in the Planning Area by County (In Acres)

County	O&C	CBWR	PD	Acquired	Other	Total Surface [1]	Reserved Minerals
Coos	96,968	59,702	9,723	249	0	166,642	7,828
Curry	79	0	31,785	105	0	31,969	2,589
Douglas	121,441	636	8,430	6	0	130,513	1,735
Lane	0	0	555	0	0	555	0
Totals	**218,488**	**60,338**	**50,493**	**360**	**0**	**329,679**	**12,152**

[1] Acreages based on most recent surveys (March 1993) taken from Master Title Plats, does not include acres gained through accretion, loss by reliction, or approximately 19 acres associated with unsurveyed islands. Does not include acres exchanged since March 1993.

responds to two needs: the need for forest habitat, and the need for forest products.

The need for forest habitat is the need for a healthy forest ecosystem with habitat that will support populations of native species and includes protection for riparian areas and waters. This need was reflected by President Clinton at the April 2, 1993, Forest Conference in Portland, Oregon.

The need for forest products from forest ecosystems is the need for a sustainable supply of timber and other forest products that will help maintain the stability of local and regional economies and contribute valuable resources to the national economy on a predictable and long-term basis. This need also was reflected by President Clinton at the Forest Conference.

The proposed Resource Management Plan (PRMP) identified in this document was developed after consideration of the following:

- Public comments at open house meetings and in correspondence.
- Comments from other government agencies.
- BLM staff analysis of the consequences of alternatives.
- Legal mandates of Federal laws and executive orders.
- Decisions made in the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* and its Attachment A (hereafter referred to as the SEIS ROD).
- Requirements of Bureau policy.

The RMP was developed under the requirements of the Federal Land Policy and Management Act (FLPMA) through the use of an interdisciplinary planning process. This RMP/EIS document is written in compliance with the National Environmental Policy Act (NEPA) and related Council on Environmental Quality regulations.

A list of the major federal laws and executive orders affecting BLM land management in western Oregon is provided in Appendix A.

Management of the O&C lands is governed by a variety of statutes, including the O&C Lands Act, FLPMA, the Endangered Species Act, and the Clean Water Act. The O&C Lands Act requires the Secretary of the Interior to manage O&C lands for permanent forest production; however, such management must also be in accord with sustained-yield principles. Further, that Act requires that management of O&C lands protect watersheds, regulate streamflow, provide for recreational facilities, and contribute to the economic stability of local communities and industries. The Act does not require the Secretary to harvest all old-growth timber nor all commercial timber as rapidly as possible or according to any particular schedule. The Secretary has discretion to determine how to manage the forest on a sustained-yield basis that provides for permanency of timber production over a long-term period. The Secretary must necessarily make judgments, informed by as much information as possible, about what kind of management will lead to permanent forest production that satisfies the principle of sustained yield.

O&C lands must also be managed in accordance with other environmental laws such as the Endangered Species Act and the Clean Water Act. Some provisions of these laws take precedence over the O&C Lands Act. For instance, the Endangered Species Act (ESA) requires the Secretary to ensure that management of O&C lands will not likely result in jeopardy to listed species or destruction or adverse modification of their critical habitat. The ESA directs the Secretary and all federal agencies to utilize their authorities to carry out programs for the conservation and recovery of listed species. Section 5(a) of the Act also directs: "the Secretary, and the Secretary of Agriculture with respect to the National Forest System, shall establish and implement a program to conserve fish, wildlife, and plants, including those which are listed as endangered species or threatened species pursuant to Section 4 of this Act" (16 U.S.C. § 1534[a]). Although several northern spotted owl recovery plans have been proposed, the Secretary has not yet adopted final recovery plans for either the northern spotted owl or the marbled murrelet. The SEIS ROD's late-successional and riparian reserve concepts are important building blocks in the development of recovery plans to achieve the conservation and recovery of those species.

One purpose of the Endangered Species Act is the preservation of ecosystems upon which endangered and threatened species depend. A forward-looking land management policy would require that federal lands be managed in a way to minimize the need to list species under the ESA. Additional species listings could have the effect of further limiting the

O&C Lands Act's goal of achieving and maintaining permanent forest production. This would contribute to the economic instability of local communities and industries, in contravention of a primary objective of Congress in enacting the O&C Lands Act. That Act does not limit the Secretary's ability to take steps now that would avoid future listings and additional disruptions.

Protection of watersheds and regulating streamflow are explicit purposes of forest production under the O&C Lands Act. Riparian reserves, including those established on O&C lands under the PRMP, are designed to restore and maintain aquatic ecosystem functions. Together with other components of the aquatic conservation strategy, riparian reserves will provide substantial watershed protection benefits. Riparian reserves will also help attain and maintain water quality standards which are a fundamental aspect of watershed protection. Both riparian reserves and late-successional reserves will help regulate streamflows, moderating peak streamflows and attendant adverse impacts to watersheds.

Relationship of the RMP to BLM Policies, Programs and Other Plans

The BLM in Oregon is developing five other RMPs concurrently with this one. The six RMPs together cover all BLM-administered lands in western Oregon. Some lands administered by the Eugene District to the north, and the Roseburg and Medford Districts to the east, adjoin lands being addressed in this plan. On other lands these districts administer there is shared management of certain resource or administrative features (e.g., watersheds and road networks). Cooperation is occurring in the planning for management of these lands.

The Draft RMP/EIS was supplemented by the SEIS. The SEIS ROD, signed jointly by the Secretary of the Interior and the Secretary of Agriculture, requires the Bureau to incorporate the land-use allocations and standards and guidelines in that decision in the Bureau's RMPs for western Oregon. The Proposed RMP is intended to be consistent with the SEIS ROD; any apparent inconsistencies are oversights or misinterpretations of SEIS ROD language. The Final SEIS describes the environmental impacts which arise from those directions. This Final EIS for the RMP incorporates the analysis in that Final SEIS.

In 1987, the BLM completed a supplement and Record Of Decision (ROD) for its 1986 *Northwest Area Noxious Weed Control EIS.* Key elements of that ROD were included in Appendix I-B of the draft RMP/EIS document. This RMP/EIS is tiered to that EIS, and the decisions made in that ROD are not addressed again in the RMP/EIS alternatives.

This RMP/EIS is tiered similarly to BLM's 1989 EIS, *Western Oregon-Management of Competing Vegetation*, regarding analysis of impacts of vegetation management activities on human health, and regarding all other impacts from the use of herbicides in management programs other than noxious weed control. A copy of the key elements of the ROD for that EIS were included as Appendix I-C in the draft RMP/EIS document. The decisions made in that ROD are also not readdressed.

BLM's Final *Oregon Wilderness* EIS was published in December 1989. It addresses two wilderness study areas in the Coos Bay District (Zwagg Island and North Sisters Rocks), and will lead to recommendations to Congress regarding designation of these areas. Pending Congressional action, the wilderness values in these areas will be protected. This issue is not further addressed in this RMP, but the RMP/EIS addresses options for management of these wilderness study areas should Congress choose not to designate them as wilderness.

This RMP/EIS is also tiered to the 1993 EIS, *Pacific Yew*, prepared by the U.S. Forest Service with BLM as a cooperating agency, regarding analysis of impacts of harvest of Pacific yew. A copy of the key elements of the ROD for that EIS is included as Appendix C of this document. The decisions made in that ROD are not readdressed.

Any finding made in the record of decision for this RMP/EIS that certain river segments studied herein are suitable for designation under the Wild and Scenic Rivers Act will be a preliminary administrative finding. It will receive further review and possible modification by the Director, BLM; Secretary of the Interior; or the President of the United States. To facilitate that review, after completion of this RMP and its record of decision, the BLM may elect or be required to prepare a study report to support recommendations to Congress for designation of specific rivers or river segments. Final decisions have been reserved by Congress unless the Governor nominates a river to the Secretary of the Interior, who may then decide to designate it.

Management on the North Spit of Coos Bay and the New River area could be impacted by the final decisions under the Coastal Barriers Resources Act. If either of these areas are designated, Bureau actions would be modified to conform with the purposes and intent of the Act.

Management of approximately 59,100 acres, or some portion thereof, of BLM-administered lands located in eastern Coos County could be impacted by the proposed *Self Sufficiency Plan of the Coquille Indian Tribe*" (The Coquille Indian Tribe 1993). A portion of that plan proposes establishment of the "Coquille Forest" in the headwaters of the Coquille River drainage, with a transfer of jurisdiction from the BLM to the Bureau of Indian Affairs as a trustee for the Coquille Indian Tribe. Bureau actions would be modified to conform with the decisions of Congress on the recommendations of the Secretary of Interior on the Plan.

Planning Process and Criteria

The BLM's planning process has nine steps:

1. Identify issues, concerns and opportunities.
2. a. Develop planning criteria.
   b. Develop State Director's guidance.
3. Collect inventory data and information.
4. Analyze the management situation.
5. Formulate alternatives.
6. Estimate effects of alternatives.
7. Select the Preferred Alternative and publish Draft RMP/EIS.
8. a. Select the Resource Management Plan and publish Proposed RMP/FEIS.
   b. Respond to any protests, and publish RMP and Record of Decision (ROD).
9. Implement, monitor and evaluate the RMP.

Publication of this document constitutes completion of Step 8a. Public involvement has occurred at several steps in the process (See Appendix GG, Public Involvement).

The planning process is designed to help the BLM identify the uses of BLM-administered lands desired by the public and consider those uses to the extent consistent with the laws established by Congress and the policies of the executive branch of the federal government regarding management of those lands.

Where BLM manages only the subsurface mineral estate, the plan and EIS address only the management of BLM-administered minerals.

Planning criteria for developing this RMP and the other five western Oregon RMPs were established by BLM's Oregon State Director. Those criteria and the guidelines for formulation of common alternatives are in Appendix B.

Issues

Early phases of public involvement identified a number of issues and concerns. Of particular relevance were public responses to a district scoping mailer of September 1986. These issues and concerns are as follows:

1. **Timber Production Practices**

   - Which forest lands will be available for intensive management of timber products or for restricted management to enhance other uses on BLM-administered lands or nearby lands?

   - Will BLM use uneven-age silvicultural systems versus even-age (e.g., clearcut, shelterwood) to meet other timber production or resource objectives?

   - What logging practices will be applied to BLM-administered lands?

   - To what extent will BLM maintain or alter the following practices on some or all commercial forest lands?

   - Precommercial thinning, commercial thinning, fertilization, brushfield and hardwood conversion, and genetics.

   - Site preparation (e.g., manual, mechanical, herbicides, and burning).

   - Vegetation control (e.g., manual, mechanical, and herbicides).

   - Animal damage control (e.g., pesticides, trapping, and tubing).

   - Should forest product quality objectives, including product diversity, influence forest management practices or minimum harvest age?

2. **Old-Growth Forests**

   - Where and how much, if any, old-growth and /or mature forest should be retained, maintained or re-established to meet various resource objectives? What management should be applied to meet the resource objectives?

3. **Habitat Diversity**

   - What levels of habitat diversity should be provided to help meet wildlife goals? To what extent, and in what places, should BLM manage habitat necessary for populations of native wildlife species?

   - Where and how should unique habitats (e.g., cliffs, talus slopes, caves, meadows, wetlands, beaches and dunes) be managed?

4. **Threatened and Endangered Species Habitat**

   - What will BLM do to manage for federally-listed threatened or endangered plants and animals?

   - What will BLM do to manage plants and animals to prevent their listing as federally threatened or endangered species?

5. **Special Areas**

   - What areas on public lands need special management attention to protect and prevent irreparable damage to important historic, cultural or scenic values; botanical or fish and wildlife resources; or other natural systems or processes or to protect life and safety from natural hazards?

   - What are the goals and objectives for each of these areas?

   - Which of these areas should be formally designated as Areas of Critical Environmental Concern (ACEC)?

6. **Visual Resources**

   - Which, if any, areas of BLM-administered lands should be managed to reduce visual impacts or maintain visual (scenic) quality?

7. **Watershed Management.**

   - What special management actions will be undertaken to comply with state water quality standards?

   - How will BLM manage for special watershed needs, such as municipal, domestic, irrigation and other uses?

8. **Streams/Riparian Areas**

   - Where and how will riparian areas be managed to protect and improve water quality, fisheries and wildlife habitat?

9. **Recreation Resources**

   - What areas or sites will be designated and/or managed to protect or enhance a variety of recreational opportunities?

9A. Wild and Scenic Rivers

   - What, if any, rivers should be found suitable for designation?

10. **Land Tenure and Access.**

   - In what areas will BLM-administered lands be sold, exchanged, or disposed under other authorities to improve management efficiency and benefit resource program objectives? In what areas will BLM attempt to acquire lands to improve management efficiency and benefit resource program goals or meet objectives?

11. **Rural Residential Management**

   - Which public lands should be allocated to receive special management practices due to concerns of neighbors who live in close proximity to the public lands?

   - Which management practices should be employed/restricted on these lands?

Another major issue (management of newly-acquired lands) involved inquiries specific to changes, if any, required in the North Spit Management Plan and to management of newly-acquired lands (such as Dean Creek and Coos Head). This issue was intended to address the management of lands acquired since the MFP was completed in 1983, and involved the following lands:

North Spit of Coos Bay	1,605 acres
Coos Head	90 acres
Dean Creek	1,040 acres
New River	883 acres
South Jetty Umpqua River	79 acres

These newly-acquired lands were considered in the development of the five common alternatives, and their resource values are addressed according to the parameters of each alternative.

Appendix I-F of the draft RMP contained a complete listing of concerns expressed to the Coos Bay District.

Issues, Concerns and Other Planning Considerations Eliminated from Detailed Studies

The alternatives addressed, but not selected, in the SEIS ROD were eliminated from district-specific study because they were adequately considered in the SEIS.

The following issue was eliminated from consideration as primary factors in the formulation of alternatives for the reasons cited:

- Grazing/range management - The few seasonal grazing leases issued by BLM in the planning area do not pose significant resource conflicts.

The following topics were eliminated from study for the reasons described:

- Use of herbicides - This topic was fully analyzed in BLM's 1989 EIS, *Western Oregon-Management of Competing Vegetation*; and BLM's 1986 EIS, *Northwest Area Noxious Weed Control*, as supplemented in 1987.
- Effects on wilderness - The effects of land uses on identified wilderness values were fully analyzed in BLM's 1989 *Oregon Wilderness* EIS.
- Effects on agriculture - BLM activities in the planning area are not expected to have measurable effects on agriculture.
- Effects on wind and hydropower resources - There are no known wind power or hydropower proposals affecting BLM-administered lands in the planning area that are legally implementable. The Mill Creek hydropower grant (OR 37851), authorized but undeveloped, was analyzed in a 1985 EA.
- Effects on Pacific yew - This topic was fully analyzed in the *Pacific Yew* EIS.

The following effects, sometimes perceived as relevant planning topics, were eliminated from study for the reasons described:

- Effects on prime and unique farm lands and paleontological resources - No discernible effects are anticipated.
- Effects on energy use - Previous analyses (e.g., the *South Coast-Curry Timber Management EIS*, BLM 1983) have shown that effects of BLM management activities in the planning area are not significant.
- Effects of off-reservation Indian tribal treaty rights or trust resources - No such treaty rights or trust resources involve BLM-administered lands in the Coos Bay District.

Western Oregon Digital Data Base

To support the RMP process, BLM developed the Western Oregon Digital Data Base (WODDB)—a geographic information systems (GIS) digital (computer) data base.

Due to the checkerboard pattern of land ownership, base thematic data was mapped on a total of 7 million acres to obtain coverage of BLM's 2.4 million acres in western Oregon. All base themes were derived from 1985/86 aerial photography and then digitized at 1:4,800 scale. Base data themes include transportation, gross vegetation, hydrology, topography, and cultural features. Base theme mapping, except topography, is complete. This information was mapped using Automated Digitizing System (ADS) software. Resource data themes were mapped at a scale of 1:12,000 or more, depending on the theme. Approximately 75 resource themes are captured on the 2.4 million acres of BLM-administered lands, including soils, forestry, big game, minerals, watersheds, spotted owls, and recreation. Additional themes will be added to meet future day-to-day resource management operational needs.

The BLM ownership is based on the Geographic Coordinate Database System, and maps were generated from this information directly in ADS. As this ownership map is computer generated, it may have different scales than other documents determined from BLM master title plats, which are based sometimes on out-of-date surveys.

The BLM is using GIS technology based on the Map Overlay and Statistical System (MOSS) family of software on Prime computers in the six western Oregon districts and the state office in Portland. Many base and resource themes have data base information associated with them. The data base information is stored in attribute files, which are linked to the graphic files by a process called DBLINK.

To build the WODDB data base, standards for each of the themes were developed and agreed upon by BLM's western Oregon districts. The WODDB Data Entry Handbook was developed with district input to provide a comprehensive and concise set of instructions, including quality control assurance, to standardize data themes between districts.

There are actually two WODDB data bases: one for the Resource Management Plans, in which the data is "frozen" in time; and another for operational uses, in which the data is updated. Updating the WODDB data is important due to the high frequency of changes in many of the resource themes, particularly roads and operations inventory.

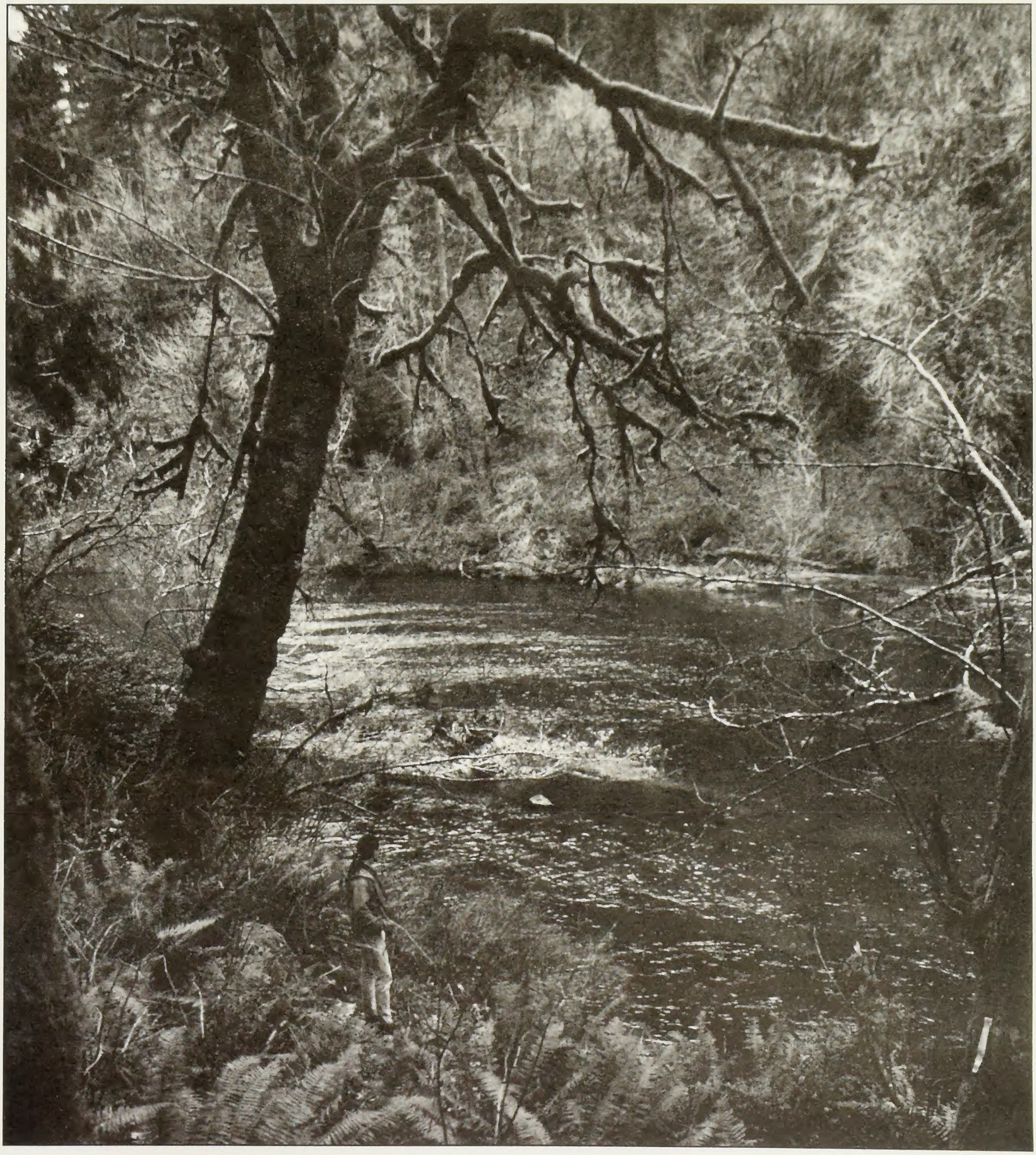
The WODDB data base has facilitated the planning effort in the following ways:

- Compute and aggregate resource data for each planning area, and display maps of that data.

- Help design alternatives in accordance with criteria established for alternative formulation and to display maps of the alternatives.

- Facilitate analysis of some of the consequences of the alternatives.

Chapter 2
Alternatives



Management Direction for the PRMP

Major Changes From Chapter 2 of the Draft Resource Management Plan

- The proposed resource management plan, which is consistent with the SEIS ROD, replaces the preferred alternative. The description of the Preferred Alternative from the draft RMP is included as Appendix D.
- The description of the proposed resource management plan includes objectives, land use allocations, and management actions/ direction in one location for reader convenience.
- Management direction common to all alternatives is located toward the end of this chapter.

Alternatives to be Analyzed and Alternatives Dropped from Detailed Study

The summary includes a brief description of the proposed resource management plan and the six alternatives that are analyzed for impacts in Chapter 4. For more detailed descriptions of the alternatives see the Proposed Management Plan in the first part of this chapter and Management Direction for Other Alternatives later in this chapter.

In the scoping of the plan, a number of alternatives or potential elements of alternatives were considered but eliminated from detailed analysis. These alternatives are discussed in the Summary of Scoping in Appendix II-A of the draft RMP. Some of them are addressed further in sensitivity analysis in this Final RMP and in Appendix IV-A of the draft RMP.

Allocations and management by the alternatives that were considered are compared in Table 2-1. Allocated acres displayed in Table 2-1 may overlap or be partly duplicated.

Introduction

The purpose of this chapter is to describe the Coos Bay District proposed resource management plan (PRMP) and the other land and resource management alternatives that were analyzed by BLM. The first section of the chapter includes a description of the objectives, major land use allocations, and management actions/direction for the PRMP. Following the PRMP description are descriptions of the other six management alternatives.

The alternative comparison tables in Chapter 2 of the draft resource management plan are included in Appendix E. All maps are located in the accompanying packet.

The Proposed Resource Management Plan

The proposed resource management plan was developed partially in response to public comments related to the Bureau of Land Management's August 1992 draft resource management plans for western Oregon. In addition, the proposed plan incorporates the land use allocations and management direction from the Record of Decision (ROD) for the *Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* (SEIS).

Two maps showing the land allocations of the PRMP are the Western Oregon Planning Strategy Map (Map 2-1) and the District Planning Strategy Map (Map 2-3).

Management direction common to all alternatives including the PRMP is located toward the end of this chapter.

Vision

The Bureau of Land Management will manage the natural resources under its jurisdiction in western Oregon to help enhance and maintain the ecological health of the environment and the social well being of human populations.

Table 2-1. Comparisons of Allocations and Management by Alternative [1]

Allocations/Management Actions by Alternative

	PRMP	PA	NA
Water Quality and Riparian Zones			
Riparian Management Area (RMA) Protection (average width in feet each side of stream)			
Stream Order 1	[2]	[3]	
Stream Order 2		75 [4]	
Stream Order 3		150	80
Stream Order 4		150	90
Stream Order 5		210	115
Stream Order 6+		240	125-200
Lakes, ponds, and other waters		150	
Riparian Reserves (acres)	203,200 [5]		
RMA (acres)		29,100	10,800
Areas excluded from harvest or other ground-disturbing activities (acres) (FGR-2)	0	0	0

A	B	C	D	E
				50
			60	60
75	75	105	140	140
75	100	150	200	200
75	140	210	280	280
75	160	240	320	320
75	100	150	200	200
13,700	17,800	25,000	42,800	61,700
0	0	0	0	87,200

Table 2-1. Comparisons of Allocations and Management by Alternative [1] (continued)

Allocations/Management Actions by Alternative

	PRMP	PA	NA
Old-growth and Mature Forest Habitat			
Management Direction	Manage based on Ecological principles for management of Late-Successional forests. Manage 43 percent of the land as Late-Successional Reserves and 2 percent as Connectivity/ Diversity Blocks.	Manage 26 percent of the land as an old-growth emphasis area. Manage 7 percent of land as connectivity area for old-growth associated species.	
Areas managed for retention and development of older forest (acres)	142,500	144,900	58,200
Area managed for maintenance of older forest characteristics (acres)	6,600	22,800	0
Older forests (mature and old-growth)	114,000	115,100	114,000
Retained at end of decade	114,000	98,700	83,000
Retained at end of 100 years	263,000	127,900	77,000

A	B	C	D	E
	Contribute to habitat diversity and old-growth in a corridor system with blocks of 640 acres connected by 80-acre stepping stone blocks.	Manage for retention and improvement of biological diversity maintaining 17 percent of the land in restoration and retention blocks.	Manage as recommended by the 1990 Conservation Strategy for the northern spotted owl.	Contribute to habitat diversity by protecting existing stands over 150 years old, suitable spotted owl habitat within two miles of each spotted owl site, and additional habitat to benefit amphibians and pileated woodpeckers
43,900	66,500	96,400	148,800	200,200
0	0	212,500	0	0
114,000	114,000	114,000	114,000	114,000
68,000	69,000	107,000	110,000	108,000
36,000	57,000	232,000	142,000	179,000

Table 2-1. Comparisons of Allocations and Management by Alternative [1] (continued)

Allocations/Management Actions by Alternative

	PRMP	PA	NA
Timber			
Forest Management Allocations (acres):			
Intensive Forest Management	55,300	140,100	243,300
Restricted	6,600	900	4,300
Enhancement of Other Uses or Not Available	247,400	168,000	57,000
Special Status Species including Threatened and Endangered Species Habitat			
Management Direction	Manage habitats of Federal candidate, State listed, and Bureau sensitive species on all BLM-Administered lands.	Same as PRMP.	
Areas managed so as not to contribute to need to list	329,600	329,600	N/A
Wildlife (including Fisheries) Habitat			
Buffer width, special habitats (feet)	100-300	100-200	0
Fish habitat improvement (miles)	40	20	20

A	B	C	D	E
265,000	241,800	0	0	83,100
0	600	212,500	160,100	25,600
43,900	66,500	96,400	148,800	200,200
Protect habitats of Federal candidate, State listed, and Bureau sensitive species where such mitigation would not diminish commercial use.	Same as A, plus protect those habitats on public domain lands.	Same as B, plus additional protection provided by management for older forests.	Protect habitats of Federal candidate, State listed, and Bureau sensitive species on all BLM-Administered lands.	Same as D.
64,600	124,300	149,600	329,600	329,600
0	0	100	100-200	100-300
20	20	20	20	20

Table 2-1. Comparisons of Allocations and Management by Alternative [1] (continued)

Allocations/Management Actions by Alternative

	PRMP	PA	NA
Special Areas			
Existing RNA/ACECs retained			
Number	1	1	1
Acres	570	570	570
Other Existing ACECs retained			
Number	1	1	1
Acres	880	880	880
New RNA/ACECs designated			
Number	0	0	0
Acres	0	0	0
Other New ACECs designated			
Number	9	9	0
Acres	7,950	7,950	0
Environmental Education Areas			
Number	1	1	1
Acres	70	70	70
Total RNA/ACECs			
Number	1	1	1
Acres	570	570	570
Total other ACECs			
Number	10	10	1
Acres	8,830	8,830	8,830
Recreation Resources			
Recreation Sites			
Existing			
Number of sites	12	11	10
Acres	1,655	1,650	600
New			
Number of sites	12	13	1
Acres	410	405	200
County Parks on BLM-Administered land			
Number of sites	6	6	6
Acres	650	650	650
Trails maintained			
Existing			
Number of trails	4	2	2
Miles	4	0.5	0.5
New			
Number of trails	8	8	0
Miles	38-52	34.5	0

A	B	C	D	E
1	1	1	1	1
570	570	570	570	570
1	1	1	1	1
880	880	880	880	880
0	2	4	5	0
0	2,300	6,340	6,800	0
0	2	2	4	9
0	690	690	1,150	7,950
0	0	1	1	1
0	0	70	70	70
1	3	5	6	1
570	2,870	6,910	7,370	570
1	3	3	5	10
880	1,570	1,570	2,030	8,830
5	10	11	11	11
1,410	1,610	1,650	1,650	1,650
0	3	9	22	22
800	120	370	580	580
6	6	6	6	6
650	650	650	650	650
2	2	2	2	2
0.5	0.5	0.5	0.5	0.5
0	3	7	11	11
0	11	36.25	43	43

Table 2-1. Comparisons of Allocations and Management by Alternative [1] (continued)

Allocations/Management Actions by Alternative

	PRMP	PA	NA
Recreation Resources (continued)			
Special Recreation Management Areas (SRMAs)			
Existing			
Number of SRMAs	4	3	0
Acres	3,700	2,040	0
New			
Number of SRMAs	3	3	0
Acres	25,700	2,690	0
Back Country Byways			
Number of roads	5	5	0
Miles	155	155	0
Acres open to OHV use	80	0	264,600
Acres OHV limited to Designated Roads and Trails	326,600	327,200	58,400
Acres closed to OHV use	3,000	2,400	6,600
Miles of Road Open	830-1,360	830-1,360	1,390
Miles of Road Closed	205-735	205-735	170
Wild and Scenic Rivers			
River segments found suitable for designation as:			
Recreational			
Number of segments	0	0	0
Miles	0	0	0
Scenic			
Number of segments	0	0	0
Miles	0	0	0
Wild			
Number of segments	0	0	0
Miles	0	0	0

A	B	C	D	E
3	3	3	3	3
2,040	2,040	2,040	2,040	2,040
0	2	2	3	3
0	1,680	2,490	2,690	2,690
0	0	5	5	5
0	0	155	155	155
0	0	0	0	0
327,200	324,900	320,800	320,800	327,200
2,400	4,700	8,800	8,800	2,400
1,565	1,565	1,040	785	525
0	0	525	780	1,040
0	0	0	0	8
0	0	0	0	175
0	0	1	1	1
0	0	9.5	9.5	9.5
0	0	0	0	0
0	0	0	0	0

Table 2-1. Comparisons of Allocations and Management by Alternative [1] (continued)

Allocations/Management Actions by Alternative

	PRMP	PA	NA
Visual Resources			
Management Direction	Manage available forest land as inventoried within 0.25 mile of recreation sites, State and Federal highways. Manage other available forest land as VRM Class IV. Manage all other land as inventoried.	Same as PRMP.	
Acres managed as VRM Class I	600	600	600
Acres managed as VRM Class II	6,600	6,600	4,300
Acres managed as VRM Class III	14,700	14,700	1,000
Acres managed as VRM Class IV	307,700	307,000	323,700

A	B	C	D	E
Manage available forest lands as VRM Class IV and all other land as inventoried.	Manage available forest land as inventoried within 0.25 mile of recreation sites, State and Federal highways, and designated rivers. Manage other available forest land as VRM Class IV. Manage all other lands as inventoried.	Same as A, except on available forest land where BLM-Administered land is more than half of the viewshed, manage as inventoried.	Manage all lands as inventoried.	Same as D, except manage as VRM Class III all lands inventoried as Class IV; and manage as Class I all lands within 0.25 mile of recreation sites, State and Federal highways, and designated rivers.
600	600	600	600	6,700
4,000	6,500	8,700	14,600	53,000
8,600	16,500	34,800	62,800	269,900
316,400	306,000	285,500	251,600	0

Table 2-1. Comparisons of Allocations and Management by Alternative [1] (continued)

Allocations/Management Actions by Alternative

	PRMP	PA	NA
Land Tenure			
Management Direction	Make exchanges within zones 2 and 3 that would enhance management opportunities to benefit one or more resource values. Sell PD lands and O&C or CBWR lands in zones that meet criteria of FLPMA Sec. 203(a). Consider R&PP leases to provide public facilities or services.	Same as PRMP.	
Acres identified for retention (Zone 1)	4,600	4,600	N/A
Acres potentially eligible for exchange only (Zone 2)	324,000	323,970	N/A
Acres potentially eligible for sale or exchange (Zone 3)	1,100	1,030	N/A

A	B	C	D	E
Make exchanges to enhance non-declining timber harvest on BLM-Administered land. Do not sell or lease commercial timberland.	Make exchanges of O&C and CBWR lands emphasizing opportunities primarily to enhance timber management opportunities. Sell PD lands and O&C lands other than available commercial forest land, meeting criteria of FLPMA Sec. 203(a). Make leases to accommodate other appropriate uses.	Same as B, except also make exchanges to contribute to conservation of biological diversity.	Emphasize exchanges to acquire lands with nontimber values. Sell lands other than available commercial forest lands, meeting criteria (1) or (2) of FLPMA Sec. 203(a). Lease only under the R&PP Act.	Same as D.
4,600	4,600	4,600	4,600	4,600
323,970	323,970	323,970	323,970	323,970
1,030	1,030	1,030	1,030	1,030

Table 2-1. Comparisons of Allocations and Management by Alternative [1] (continued)

Allocations/Management Actions by Alternative

	PRMP	PA	NA
Rights-of-Way Avoidance Areas (acres) [6]	146,700	7,300	1,600
Rights-of-Way Exclusion Areas (acres)	600	600	600
Energy and Minerals Management			
Acres available for oil and gas and geothermal leasing	328,000	327,400	327,400
Acres closed to oil and gas and geothermal leasing	1,600	1,600	1,600
Acres open to mining claim location and operation	317,100	322,200	321,900
Acres closed to mining location	12,500	6,800	7,100
Rural Interface Area Management			
Acres considered for alternative management practices	2,100	2,100	0
Acres where clearcutting, aerial herbicide, and prescribed burning excluded	0	0	0
Acres managed for VRM Class II objectives	0	0	0
Acres managed for VRM Class III objectives	2,100	2,100	0

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[1] See narrative for management direction common to all alternatives.

[2] Perennial and intermittent streams and other waters would be allocated as Riparian Reserves with varying widths. See Chapter 2, Riparian.

[3] Order 1 and 2 perennial streams would have a 75-foot RMA.

[4] Order 1 and 2 fish-bearing streams would have a 150-foot RMA.

[5] Riparian Reserves occur within all other allocations.

[6] Does not include threatened and endangered species habitat, which would also be right-of-way avoidance areas.

A	B	C	D	E
200	2,600	6,100	6,700	9,800
600	2,900	6,900	6,900	6,700
327,400	327,400	327,400	327,400	327,400
1,600	1,600	1,600	1,600	1,600
322,200	319,900	315,800	315,800	322,200
6,800	9,100	13,200	13,200	6,800
0	2,100	2,100	2,100	6,700
0	0	0	2,100	6,700
0	0	0	2,100	6,700
0	2,100	2,100	0	0

This vision is supported by several basic principles:

- Natural resources can be managed to provide for human use and a healthy environment.
- Resource management must be focused on ecological principles to reduce the need for single resource or single species management.
- Stewardship—the involvement of people working with natural processes—is essential for successful implementation.
- The Bureau of Land Management cannot achieve this vision alone but can, by its management processes and through cooperation with others, be a significant contributor to its achievement.
- A carefully designed program of monitoring, research and adaptation will be the change mechanism for achieving this vision.

Strategy

Lands administered by the Bureau of Land Management will be managed to maintain healthy, functioning ecosystems while providing a sustainable production of natural resources. This management strategy is called ecosystem management and involves the use of ecological, economic, social, and managerial principles to ensure the sustained condition of the whole. Ecosystem management emphasizes the complete ecosystem instead of individual components and looks at sustainable systems and products that people want and need. It seeks a balance between maintenance and restoration of natural systems and sustainable yield of resources.

The building blocks for this strategy are comprised of several major land use allocations—Riparian Reserves, Late-Successional Reserves, and the Matrix which includes General Forest Management Areas and Connectivity/Diversity Blocks. These land use allocations are located and configured in the landscape to support overall ecosystem function and to meet the vision for management of federal lands in western Oregon. The strategy considers a variety of special purpose management areas such as recreation sites, wild and scenic rivers, and visual resource management areas.

Each land use allocation will be managed according to specific objectives and management actions/direction. During initial implementation of the plan, the stated objectives and management actions/direction will provide the rules and limits that govern actions and also provide the principles that specify the environmental conditions or levels to be achieved and maintained. The stated objectives and management actions/direction will be refined as BLM gains experience in implementing the plan and applying the adaptive management concepts for specific geographic areas.

Two major management concepts underlay the objectives and management actions/direction: (1) Ecological Principles for Management of Late-Successional Forests, and (2) the Aquatic Conservation Strategy. These concepts are summarized below.

Ecological Principles for Management of Late-Successional Forests

One goal of this plan is to maintain late-successional and old-growth species habitat and ecosystems on federal lands. A second goal is to maintain biological diversity associated with native species and ecosystems in accordance with laws and regulations.

All land use allocations described in this plan will contribute to these two goals. For instance, Late-Successional and Riparian Reserves and many special management areas (e.g., areas of critical environmental concern) will be managed to enhance and/or maintain late-successional forest conditions. The General Forest Management Area and Connectivity/Diversity Blocks will be managed to retain late-successional forest legacies (e.g., coarse woody debris, green trees, snags, and late-successional forest patches). These and other land use allocations and resource programs are described in detail below.

See the SEIS ROD (Appendix F) for additional information about ecological principles for management of late-successional forests.

Aquatic Conservation Strategy

The Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and their aquatic ecosystems on public lands. The strategy would protect salmon and steelhead habitat on federal lands managed by the Forest Service and Bureau of Land Management within the range of the Pacific Ocean anadromy.

The Aquatic Conservation Strategy is designed to meet the following objectives:

- Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.

- Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These lineages must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

- Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

- Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain in the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

- Maintain and restore the sediment regime under which an aquatic ecosystem evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

- Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing (i.e., movement of woody debris through the aquatic system). The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

- Maintain and restore the timing, variability, and duration of floodplain inundation and the water table elevation in meadows and wetlands.

- Maintain and restore the species composition and structural diversity of plant communities in riparian zones and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

- Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

The components of the Aquatic Conservation Strategy are Riparian Reserves, Key Watersheds, Watershed Analysis, and Watershed Restoration.

Riparian Reserves

See Riparian Reserves in the Land Use Allocation section.

Key Watersheds

A system of Key Watersheds that serve as refugia is crucial for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species. These refugia include areas of high quality habitat and areas of degraded habitat. Key Watersheds with high quality conditions will serve as anchors for the potential recovery of depressed stocks. Those of lower quality habitat have high potential for restoration and will become future sources of high quality habitat with the implementation of a comprehensive restoration program.

There are two types of Key Watersheds—Tier 1 and Tier 2. Tier 1 watersheds contribute directly to conservation of at-risk anadromous salmonids, bull trout, and resident fish species. They also have a high potential of being restored as part of a watershed restoration program. Tier 2 watersheds do not contain at-risk fish stocks, but they are important sources of high quality water.

Key Watersheds in the district are listed in Table 2-2, and their locations are shown on Map 2-3. All Key Watersheds on Table 2-2 are Tier 1; there are no Tier 2 Watersheds in the district.

Key Watersheds overlay portions of all land use allocations in the district and place additional management requirements or emphasis on activities in those areas.

Table 2-2. Key Watersheds in the Coos Bay District

Key Watershed Name	Tier	Acres Total	Acres BLM
Upper Smith River	1	5,000	3,200
North Fork Smith River	1	43,700	3,200
Upper Fiddle Creek	1	6,400	1,200
Wassen Creek	1	17,800	6,800
Franklin Creek	1	4,600	100
Paradise Creek	1	11,900	6,400
Tioga Creek	1	24,600	15,600
Upper North Fork Coquille River	1	5,400	4,100
North Fork Coquille, Cherry Creek	1	8,300	6,100
South Fork Coquille	1	22,800	8,400
Dry Creek	1	11,900	100
Elk River	1	20,400	700
North Fork Chetco	1	20,400	8,400

Management Actions/Direction

1. In Key Watersheds, prepare watershed analyses prior to resource management activity, including timber harvest. Until completion of watershed analyses, proceed with minor activities—such as those categorically excluded under the NEPA regulations (except timber harvest)—contingent on their consistency with Aquatic Conservation Strategy objectives. Apply Riparian Reserve management actions/direction.

2. Reduce existing road mileage within Key Watersheds. If funding is insufficient to implement reductions, do not construct (nor authorize through discretionary permits) a net increase in road mileage in Key Watersheds.

3. Give highest priority to watershed restoration in Key Watersheds.

Watershed Analysis

For watershed analysis requirements, see the Watershed Analysis section (toward the end of this chapter) and the SEIS ROD (Appendix F).

Watershed Restoration

Watershed restoration will be an integral part of a program to aid recovery of fish habitat, riparian habitat, and water quality. The program's most important components are control and prevention of road-related runoff and sediment production, restoration of the condition of riparian vegetation, and restoration of instream habitat complexity. Other restoration opportunities include meadow and wetland restoration and mine reclamation.

Management Actions/Direction

1. Prepare watershed analyses and plans prior to restoration activities. See the Watershed Analysis section.

2. Focus watershed restoration on removing some roads and, where needed, upgrading those that remain in the system.

3. Apply silvicultural treatments to restore large conifers in Riparian Reserves.

4. Restore stream channel complexity. Instream structures will only be used in the short term and not as a mitigation measure.

Additional information about the Aquatic Conservation Strategy is in the SEIS ROD (Appendix F).

Land Use Allocations and Resource Programs

This section provides a description of objectives, land use allocations, and management actions/ direction for this PRMP. The term "land use allocations" is used in two ways. First, it pertains to the major land use allocation categories derived from the SEIS and its ROD (e.g., Riparian Reserves and Late-Successional Reserves) and the still relevant allocations of the Coos Bay District Draft Resource Management Plan. The second use pertains to data and text describing specific allocations (e.g., acres, miles, and number of sites) under each land use allocation and resource program category.

The rest of the Land Use Allocation and Resource Program section has three major parts:

- Management actions/direction for all land use allocations and resource programs.
- Specific land use allocations and their objectives, allocations, and management actions/direction.
- Resource programs and their objectives, allocations, and management actions/ direction.

Although described separately, each of these elements contributes collectively and cumulatively to meeting the overall management strategy and must be considered together to accurately reflect the concept of ecosystem management. There is some duplication of objectives and management actions/ direction for land use allocations and resource programs. This duplication, however, enables a reader interested in either topic to find a basic package of related management guidance in one location.

Most resource programs have basic requirements for activities such as inventory, site-specific analysis, planning, and environmental assessment prior to project implementation and monitoring after project implementation. Inherent in the proposed resource management plan is a BLM commitment to continue these activities in the future. For the sake of simplifying text, these activities are generally not repeated in the management actions/direction that follow.

A summary of the land use allocations and management actions/direction for the proposed resource management plan is in Table 2-1. Most land use allocations are shown on the Chapter 2 maps in the accompanying packet.

Management Actions/Direction for All Land Use Allocations and Resource Programs

The SEIS ROD provides guidance for six topics that apply to all land use allocations. Guidance for four of these topics is under the Recreation, Fire/Fuels Management, Range Resources and Research sections (toward the end of this chapter). Guidance for the other two topics is described below.

All management actions/direction in this PRMP are subject to refinement through planning based on watershed analysis and the adaptive management process. In some areas, land use allocations overlap. A hierarchy of allocations and related management actions/direction will be used to guide plan implementation (see SEIS ROD in Appendix F).

Survey and Manage for Amphibians, Mammals, Bryophytes, Mollusks, Vascular Plants, Fungi, Lichens, and Arthropods

Implement the survey and manage provision of the SEIS ROD within the range of SEIS special attention species and the particular habitats they are known to occupy. Appendix G shows which species are covered by this provision, and which of the following four categories and management actions/direction are to be applied to each:

1. Manage known sites (highest priority).
    a. Acquire information on these sites, make it available to all project planners, and use it to design or modify activities.
    b. Protect known sites. For some species, apply specific management treatments such as prescribed fire.
    c. For rare and endemic fungus species, temporarily withdraw known sites from ground-disturbing activities until the sites can be thoroughly surveyed and site-specific measures prescribed.
2. Survey prior to ground-disturbing activities and manage sites.

a. Continue existing efforts to survey and manage rare and sensitive species habitat.

b. For species without survey protocols, start immediately to design protocols and implement surveys.

c. Within the known or suspected ranges and within the habitat types of vegetation communities associated with the species, survey for:

  - Del Norte salamander
  - Siskiyou Mountains salamander
  - Red tree voles

These surveys will precede the design of all ground-disturbing activities that will be implemented in 1997 or later.

d. For the other species listed in Appendix G, begin development of survey protocols promptly and proceed with surveys as soon as possible. These surveys will be completed prior to ground-disturbing activities that will be implemented in Fiscal Year 1999 or later. Work to establish habitat requirements and survey protocols may be prioritized relative to the estimated threats to the species as reflected in the SEIS.

e. Conduct surveys at a scale most appropriate to the species.

f. Develop management actions/direction to manage habitat for the species on sites where they are located.

g. Incorporate survey protocols and proposed site management in interagency conservation strategies developed as part of ongoing planning efforts coordinated by the Regional Ecosystem Office.

3. Conduct extensive surveys and manage sites.

a. Conduct extensive surveys for the species to find high-priority sites for species management. Specific surveys prior to ground-disturbing activities are not a requirement.

b. Conduct surveys according to a schedule that is most efficient and identify sites for protection at that time.

c. Design these surveys for efficiency and develop standardized protocols.

d. Begin these surveys by 1996.

4. Conduct general regional surveys.

a. Survey to acquire additional information and to determine necessary levels of protection for arthropods, fungi species not classed as rare and endemic, bryophytes, and lichens.

b. Initiate these surveys no later than Fiscal Year 1996 and complete them within 10 years.

Protection Buffers

Provide protection buffers for specific rare and locally endemic species and other species in the upland forest matrix. A list of these species and related management actions/direction are presented in Appendix G and the section on Special Status and SEIS Special Attention Species. These species are likely to be assured viability if they occur within reserves. However, there might be occupied locations outside reserves that will be important to protect as well.

Apply the following management actions/direction:

1. Develop survey protocols that will ensure a high likelihood of locating sites occupied by these species.
2. Following development of survey protocols and prior to ground-disturbing activities, conduct surveys within the known or suspected ranges of the species and within the habitat types or vegetation communities occupied by the species. See the previous Survey and Manage section for an implementation schedule.
3. When located, protect the occupied sites.

See Special Status and SEIS Special Attention Species section for additional details.

Specific Land Use Allocations

This section describes specific land use allocations developed for the SEIS ROD.

Two of the allocations in the SEIS ROD—Congressionally Reserved Areas and Administratively Withdrawn Areas—are simply recognition of valid resource management decisions in existing or proposed plans. These allocations are fully incorporated in the resource program elements of this proposed resource management plan. They are not described as separate land use allocations in this document.

The following areas in the district are Congressionally Reserved:

- Squaw Island Wilderness
- Cherry Creek Research Natural Area

The types of Administratively Withdrawn areas in the district are:

- Existing and proposed Special Areas
- Existing and proposed recreation areas/sites
- Progeny test sites
- Seed production areas
- Quarry sites
- Non-forest lands
- Lands included in Timber Production Capability Classification (TPCC) categories of Nonsuitable Woodlands and Suitable Woodlands (See Figure 2-1).

Riparian Reserves

Objectives

The following material summarizes Riparian Reserve direction. Details regarding this direction are in the SEIS ROD (Appendix F)

See Aquatic Conservation Strategy Objectives.

Provide habitat for special status, SEIS special attention, and other terrestrial species.

Land Use Allocations

There are approximately 203,200 acres of Riparian Reserves in the district. Calculation of these acres is based on prescribed widths and estimated miles of stream in the various categories described in the SEIS ROD. The widths are intended to provide a high level of fish, wildlife and plant habitat, and riparian protection until watershed and site analysis can be completed. Although Riparian Reserve boundaries on permanently-flowing streams may be adjusted, they are considered to be the approximate widths necessary for attaining Aquatic Conservation Strategy objectives. Post-watershed analysis Riparian Reserve boundaries for permanently-flowing streams will approximate the boundaries described below. Following watershed analysis, Riparian Reserve boundaries for intermittent streams may be different from the existing boundaries. Determination of final boundaries will be based on hydrologic, geomorphic and ecologic processes in a watershed affecting intermittent streams. The widths of Riparian Reserves apply to all watersheds until watershed analysis is completed, a site-specific analysis is conducted and described, and the rationale for final Riparian Reserve boundaries is presented through the appropriate NEPA decision-making process.

Initial Riparian Reserve widths are as follows:

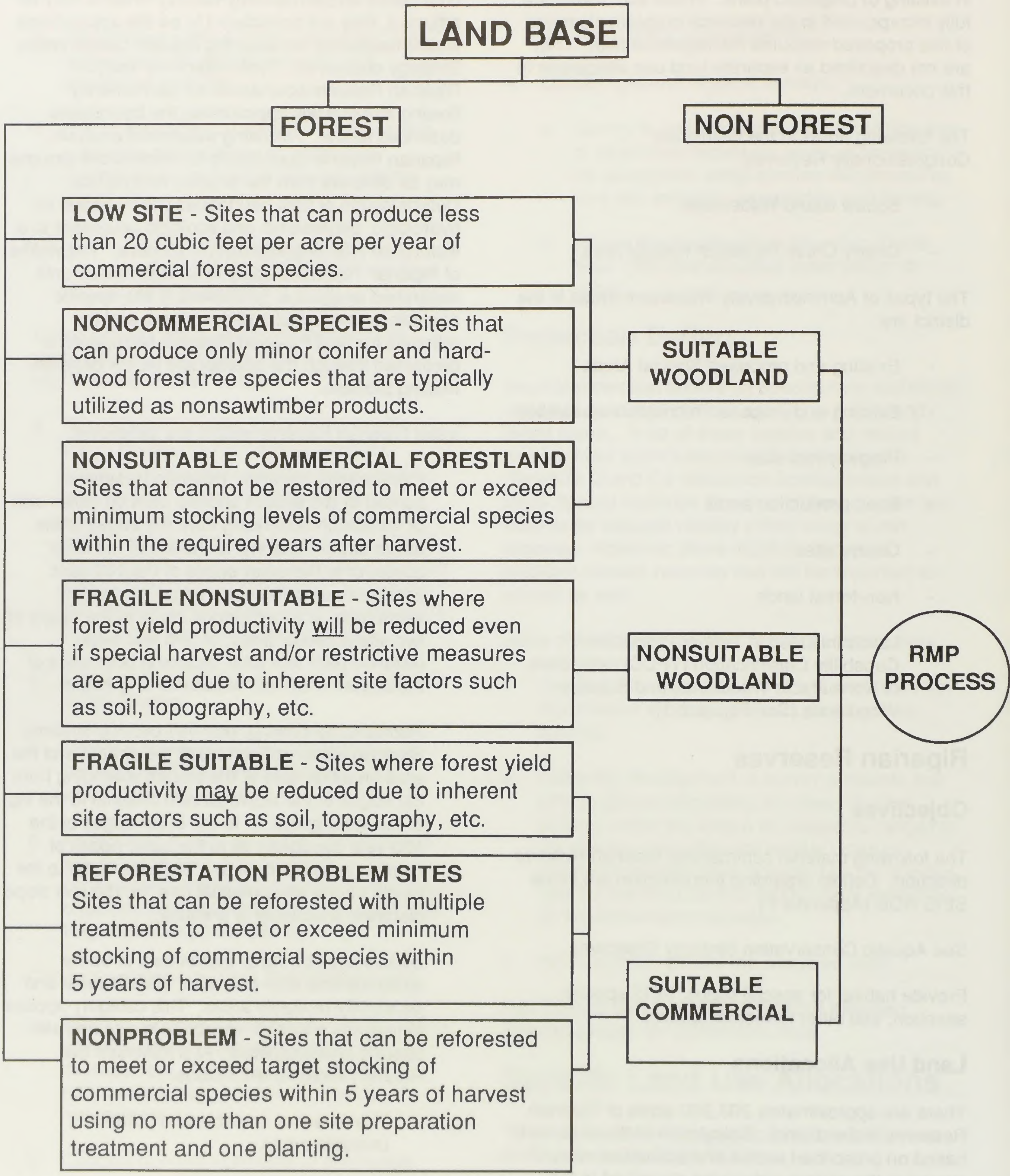
Fish-bearing streams. Riparian Reserves consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream channel), whichever is greatest.

Permanently-flowing, non-fish-bearing streams. Riparian Reserves consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance, whichever is greatest.

Seasonally-flowing or intermittent streams, wetlands less than one acre, and unstable and potentially unstable areas. This category applies to features with high variability in size and site-specific characteristics. At a minimum the Riparian Reserve will include:

- The extent of unstable and potentially unstable areas.
- The stream channel and the area extending to the top of the inner gorge.
- The stream channel or wetland and the area

Figure 2-1. TPCC Categories



LOW SITE - Sites that can produce less than 20 cubic feet per acre per year of commercial forest species.

NONCOMMERCIAL SPECIES - Sites that can produce only minor conifer and hardwood forest tree species that are typically utilized as nonsawtimber products.

NONSUITABLE COMMERCIAL FORESTLAND Sites that cannot be restored to meet or exceed minimum stocking levels of commercial species within the required years after harvest.

FRAGILE NONSUITABLE - Sites where forest yield productivity will be reduced even if special harvest and/or restrictive measures are applied due to inherent site factors such as soil, topography, etc.

FRAGILE SUITABLE - Sites where forest yield productivity may be reduced due to inherent site factors such as soil, topography, etc.

REFORESTATION PROBLEM SITES Sites that can be reforested with multiple treatments to meet or exceed minimum stocking of commercial species within 5 years of harvest.

NONPROBLEM - Sites that can be reforested to meet or exceed target stocking of commercial species within 5 years of harvest using no more than one site preparation treatment and one planting.

from the edges of the stream channel or wetland to the outer edges of the riparian vegetation.

- The area extending from the edges of the stream channel to a distance equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greatest.

Constructed ponds and reservoirs, and wetlands greater than one acre. Riparian Reserves consist of the body of water or wetland and the area to the outer edges of the riparian vegetation, or to the extent of seasonally-saturated soil, or to the extent of unstable and potentially unstable areas, or to a distance equal to the height of one site-potential tree, or to 150 feet slope distance from the edge of a wetland greater than one acre or the maximum pool elevation of constructed ponds and reservoirs, whichever is greatest. (Riparian vegetation and seasonally-saturated soils will generally constitute a wetland and will be managed as prescribed for wetlands.)

Lakes and Natural Ponds. Riparian Reserves consist of the body of water and the area to the outer edges of the riparian vegetation, or to the extent of seasonally-saturated soil, or to the extent of unstable and potentially unstable areas, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance, whichever is greatest. (Riparian vegetation and seasonally-saturated soils will generally constitute a wetland and will be managed as prescribed for wetlands.)

Riparian Reserves are illustrated in Figure 2-2.

Management Actions/Direction

General

As a general rule, management actions/direction for Riparian Reserves prohibit or regulate activities that retard or prevent attainment of Aquatic Conservation Strategy objectives. Watershed analysis and appropriate NEPA compliance will be required to change Riparian Reserves in all watersheds.

Apply the management actions/direction in the Special Status and SEIS Special Attention Species section.

Implement the following management actions/direction in Riparian Reserves. (Management actions/direction in this section are supplemented by Best Management Practices in Appendix H.)

Timber Management

Do not conduct nor allow timber harvest—including fuelwood cutting—in Riparian Reserves, except as follows:

- Allow salvage and fuelwood cutting if required to attain Aquatic Conservation Strategy objectives where catastrophic events such as fire, flooding, volcanic, wind, or insect damage result in degraded riparian conditions.

- Remove salvage trees only when watershed analysis determines that present and future woody debris needs are met and other Aquatic Conservation Strategy objectives are not adversely affected.

- Apply silvicultural practices for Riparian Reserves to control stocking, re-establish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives.

Riparian Reserve acres are not included in calculations of the probable sale quantity.

Roads Management

Cooperate with federal, state, and county agencies and work with private parties with road use agreements to achieve consistency in road design, operation, and maintenance necessary to attain Aquatic Conservation Strategy objectives.

For each existing or planned road, meet Aquatic Conservation Strategy objectives by:

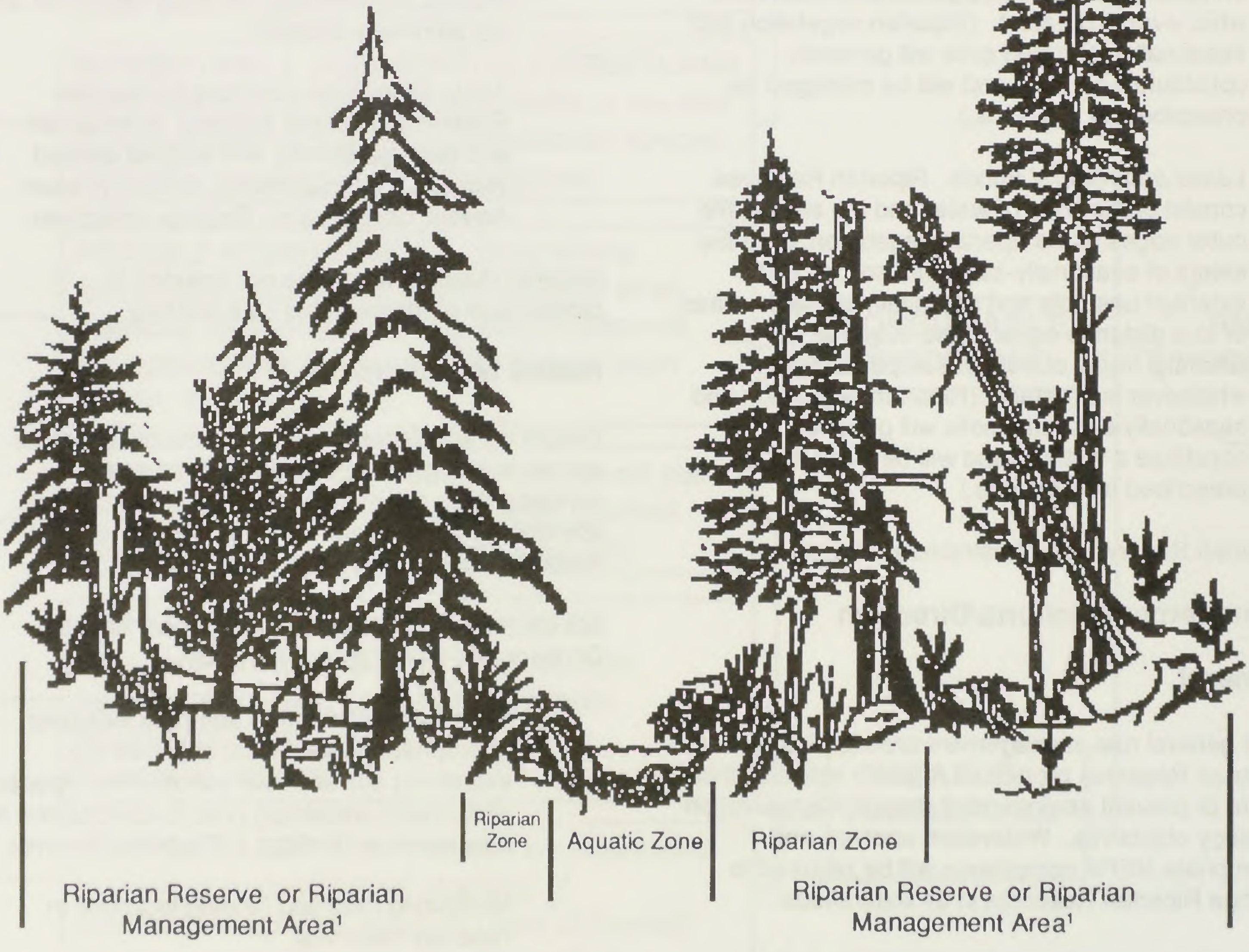
- Completing watershed analyses including appropriate geotechnical analyses (i.e., examining soil and rock conditions in riparian and stream crossings) prior to construction of new roads or landings in Riparian Reserves.

- Minimizing road and landing locations in Riparian Reserves.

- Preparing road design criteria, elements, and standards that govern construction and reconstruction.

- Preparing operation and maintenance criteria that govern road operation, maintenance, and management.

Figure 2-2 Riparian Zone Example


Riparian Zone
Aquatic Zone
Riparian Zone
Riparian Reserve or Riparian Management Area[1]
Riparian Reserve or Riparian Management Area[1]

[1] **Varies by alternative**

Figure not shown to scale.

- Minimizing disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow.
- Restricting sidecasting as necessary to prevent the introduction of sediment to streams.
- Avoiding wetlands entirely when constructing new roads.

Determine the influence of each road on the Aquatic Conservation Strategy objectives through watershed analysis. Meet Aquatic Conservation Strategy objectives by:

- Reconstructing roads and associated drainage features that pose a substantial risk.
- Prioritizing reconstruction based on current and potential impact to riparian resources and the ecological value of the riparian resources affected.
- Closing and stabilizing (or obliterating and stabilizing) roads based on the ongoing and potential effects to Aquatic Conservation Strategy objectives and considering short-term and long-term transportation needs.

Design and construct new culverts, bridges, and other stream crossings and improve existing culverts, bridges, and other stream crossings determined to pose a substantial risk to riparian conditions. New structures and improvements will be designed to accommodate at least the 100-year flood, including associated bedload and debris. Priority for upgrading will be based on the potential impact and the ecological value of the riparian resources affected. Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.

Minimize sediment delivery to streams from roads. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is infeasible or unsafe. Route road drainage away from potentially unstable channels, fills, and hillslopes.

Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams (e.g., streams which can be made available to anadromous fish by removing obstacles to passage).

Develop and implement a Road Management Plan or a Transportation Management Plan that will meet the Aquatic Conservation Strategy objectives. As a minimum, this plan will include provisions for the following activities:

- Inspections and maintenance during storm events.
- Inspections and maintenance after storm events.
- Road operation and maintenance giving high priority to identifying and correcting road drainage problems that contribute to degrading riparian resources.
- Traffic regulation during wet periods to prevent damage to riparian resources.
- Establishing the purpose of each road by developing the Road Management Objective.

Grazing Management

Through a planning and environmental analysis process appropriate to the action, adjust or eliminate grazing practices that retard or prevent attainment of Aquatic Conservation Strategy objectives.

Locate new livestock handling and/or management facilities outside Riparian Reserves. For existing livestock handling facilities inside Riparian Reserves, ensure that Aquatic Conservation Strategy objectives are met. Where these objectives cannot be met, require relocation or removal of such facilities.

Limit livestock trailing, bedding, watering, loading, and other handling efforts to those areas and times that will ensure Aquatic Conservation Strategy objectives are met.

Recreation Management

Design new recreational facilities within Riparian Reserves, including trails and dispersed sites, so as not to prevent meeting Aquatic Conservation Strategy objectives. Construction of these facilities should not prevent future attainment of these objectives. For existing recreation facilities within Riparian Reserves, evaluate and mitigate impacts to ensure that these do not prevent, and to the extent practicable contribute to, attainment of Aquatic Conservation Strategy objectives.

Adjust dispersed and developed recreation practices that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where adjustment measures—such as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, and/or specific site closures—are not effective, eliminate the practice or occupancy.

Address attainment of Aquatic Conservation Strategy objectives in Wild and Scenic River and Wilderness management plans.

Minerals Management

Note: The following management actions/direction differ from the standards and guidelines in the SEIS ROD, since the standards and guidelines are not all implementable under current laws and regulations. The more stringent standards and guidelines in the SEIS ROD (Appendix F) will be adopted at such time as changes in current laws and/or regulations authorize their implementation.

For any proposed locatable mining operation in Riparian Reserves— other than notice level or casual use—require the following actions by the operator consistent with 43 CFR 3809 regulations:

- Prepare a Plan of Operations, including a reclamation plan and reclamation bond for all mining operations in Riparian Reserves. Such plans and bonds will address the costs of removing facilities, equipment, and materials; recontouring of disturbed areas to an approved topography; isolating and neutralizing or removing toxic or potentially toxic materials; salvaging and replacing topsoil; and revegetating to meet Aquatic Conservation Strategy objectives.

- Locate structures, support facilities, and roads outside Riparian Reserves. If no alternative to siting facilities in Riparian Reserves exists, locate in a way compatible with Aquatic Conservation Strategy objectives. Road construction will be kept to the minimum necessary for the approved mineral activity. Roads will be constructed and maintained to meet road management standards and to minimize damage to resources in Riparian Reserves. When a road is no longer required for mineral or land management activities, it will be reclaimed. In any case, access roads will be constructed consistent with 43 CFR 3809 and acceptable road construction standards and will minimize damage to resources in Riparian Reserves.

- Avoid locating solid and sanitary waste facilities in Riparian Reserves. If no alternative to locating mine waste (waste rock, spent ore, and tailings) facilities in Riparian Reserves exists, if releases can be prevented, and if stability can be ensured, then:

- Analyze the waste material using the best conventional sampling methods and analytic techniques to determine its chemical and physical stability characteristics.

- Locate and design the waste facilities using best conventional techniques to ensure mass stability and prevent the release of acid or toxic materials. If the best conventional technology is not sufficient to prevent such releases and ensure stability over the long term, prohibit such facilities in Riparian Reserves.

- Reclaim waste facilities after operations to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives.

- Monitor waste and waste facilities after operations to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives.

- Require reclamation bonds adequate to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives.

Where an existing operator is in noncompliance at the notice level (i.e., causing unnecessary or undue degradation), require actions similar to those stated above to meet the intent of 43 CFR 3809.

For leasable mineral activity in Riparian Reserves, prohibit surface occupancy for oil, gas, and geothermal exploration and development activities where leases do not exist. Where possible, adjust the stipulations in existing leases to eliminate impacts that retard or prevent the attainment of Aquatic Conservation Strategy objectives, consistent with existing lease terms and stipulations.

Allow development of saleable minerals, such as sand and gravel, within Riparian Reserves only if

Aquatic Conservation Strategy objectives can be met.

Develop inspection and monitoring requirements and include such requirements in exploration and mining plans and in leases or permits consistent with existing laws and regulations. Evaluate the results of inspection and monitoring to determine if modification of plans, leases, and permits is needed to eliminate impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives.

Fire/Fuels Management

Design fuel treatment and fire suppression strategies, practices, and activities to meet Aquatic Conservation Strategy objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies will recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management activities could be damaging to long-term ecosystem function.

Locate incident bases, camps, helibases, staging areas, helispots, and other centers for incident activities outside of Riparian Reserves. If the only suitable location for such activities is within the Riparian Reserve, an exemption may be granted following a review and recommendation by a resource advisor. The advisor will prescribe the location, use conditions, and rehabilitation requirements. Utilize an interdisciplinary team to predetermine suitable incident base and helibase locations.

Minimize delivery of chemical retardant, foam, or other additives to surface waters. An exception may be warranted in situations where overriding immediate safety imperatives exist, or following a review and recommendation by a resource advisor, when an escape would cause more long-term damage.

Design prescribed burn projects and prescriptions to contribute to attainment of Aquatic Conservation Strategy objectives.

Immediately establish an emergency team to develop a rehabilitation treatment plan needed to attain Aquatic Conservation Strategy objectives whenever Riparian Reserves are significantly damaged by a wildfire or when a prescribed fire is burning outside prescribed parameters.

Limit the size of all wildfires.

Consider allowing some natural fires to burn under prescribed conditions. This decision will be based on additional analysis and planning.

Consider rapid extinguishing of smoldering coarse woody debris and duff.

Locate and manage water-drafting sites (e.g., sites where water is pumped to control or suppress fires) to minimize adverse effects on riparian habitat and water quality as consistent with Aquatic Conservation Strategy objectives.

Lands

Identify instream flows needed to maintain riparian resources, channel conditions, and fish passage.

Issue leases, permits, rights-of-way, and easements to avoid adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where legally possible, adjust existing leases, permits, rights-of-way, and easements to eliminate adverse effects that retard or prevent the attainment of Aquatic Conservation Strategy objectives. If adjustments are not effective and where legally possible, eliminate the activity. Priority for modifying existing leases, permits, rights-of-way, and easements will be based on the actual or potential impact and the ecological value of the riparian resources affected.

Use land acquisition, exchange, and conservation easements to meet Aquatic Conservation Strategy objectives and facilitate restoration of fish stocks and other species at risk of extinction.

For proposed hydroelectric projects under the jurisdiction of the Federal Energy Regulatory Commission (the Commission), provide timely, written comments regarding maintenance of instream flows and habitat conditions and maintenance/restoration of riparian resources and stream channel integrity. Request the Commission to locate proposed support facilities outside of Riparian Reserves. For existing support facilities inside Riparian Reserves that are essential to proper management, provide recommendations to the Commission that ensure Aquatic Conservation Strategy objectives are met. Where these objectives cannot be met, provide recommendations to the Commission that such support facilities should be relocated. Existing support facilities that must be located in the Riparian Reserves should be located, operated, and maintained with an emphasis to eliminate adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives.

For other hydroelectric and surface water development proposals in Tier One Key Watersheds, require instream flows and habitat conditions that maintain or restore riparian resources, favorable channel conditions, and fish passage. Coordinate this process with the appropriate state agencies. For other hydroelectric and surface water development proposals in all other watersheds, give priority emphasis to instream flows and habitat conditions that maintain or restore riparian resources, favorable channel conditions, and fish passage. Coordinate this process with the appropriate state agencies.

General Riparian Area Management

Identify and attempt to secure instream flows needed to maintain riparian resources, channel conditions, and aquatic habitat.

Fell trees in Riparian Reserves when they pose a safety risk. Keep felled trees onsite when needed to meet objectives for coarse woody debris retention.

Apply herbicides, insecticides, other toxicants, and other chemicals only in a manner that avoids impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives.

Locate water-drafting sites to minimize adverse effects on stream channel stability, sedimentation, and instream flows needed to maintain riparian resources, channel conditions, and fish habitat.

Watershed and Habitat Restoration

Design and implement watershed restoration projects in a manner that promotes long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and attains Aquatic Conservation Strategy objectives.

Cooperate with federal, state, local, and tribal agencies, and private landowners to develop watershed-based coordinated resource management plans or other cooperative agreements to meet Aquatic Conservation Strategy objectives.

Prevent watershed and habitat degradation rather than relying on mitigation measures or planned restoration.

Fish and Wildlife Management

Design and implement fish and wildlife habitat restoration and enhancement activities in a manner that contributes to attainment of Aquatic Conservation Strategy objectives.

Design, construct, and operate fish and wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of Aquatic Conservation Strategy objectives. For existing fish and wildlife interpretive and other user-enhancement facilities inside Riparian Reserves, ensure that Aquatic Conservation Strategy objectives are met. Where Aquatic Conservation Strategy objectives cannot be met, relocate or close such facilities.

Cooperate with federal, tribal, and state wildlife management agencies to identify and eliminate wild ungulate impacts that are inconsistent with attainment of Aquatic Conservation Strategy objectives.

Cooperate with federal, tribal, and state fish management agencies to identify and eliminate impacts associated with habitat manipulation, fish stocking, harvest, and poaching that threaten the continued existence and distribution of native fish stocks inhabiting streams with adjacent or nearby federal lands.

Late-Successional Reserves

Objectives

The following material summarizes Late-Successional Reserve direction. For details on this direction, see the SEIS ROD (Appendix F).

Protect and enhance conditions of late-successional and old-growth forest ecosystems that serve as habitat for late-successional and old-growth forest-related species including the northern spotted owl and marbled murrelet.

Maintain a functional, interacting, late-successional and old-growth forest ecosystem.

Land Use Allocations

There are approximately 133,700 acres of mapped Late-Successional Reserves in the district. The five components of this reserve system are:

1. Mapped Late-Successional Reserves

   These reserves incorporate Key Watersheds to the extent practicable; some or parts of the most ecologically significant and ecologically significant late-successional forests identified by the Scientific Panel on Late-Successional Forest Ecosystems; and some or parts of the Designated Conservation Areas from the Final Draft Spotted Owl Recovery Plan.

2. Late-Successional/Old Growth 1 and 2 areas within Marbled Murrelet Zone 1, as mapped by the Scientific Panel on Late-Successional Forest Ecosystems.

3. Occupied Marbled Murrelet Sites.

   See Special Status and SEIS Special Attention Species section.

4. Known Spotted Owl Activity Centers (as of January 1, 1994).

   See Special Status and SEIS Special Attention Species section.

5. Protection Buffers.

   See Special Status and SEIS Special Attention Species section.

See Map 2-3 for locations of Late-Successional Reserves. Occupied marbled murrelet sites, known spotted owl activity centers, and protection buffers are unmapped.

Management Actions/Direction

General

Apply the management actions/direction in the Special Status and SEIS Special Attention Species section.

Develop Late-Successional Reserve assessments prior to habitat manipulation. See Management Assessments and Plans (toward the end of this chapter) for additional information.

Plan and implement non-silvicultural activities inside Late-Successional Reserves that are neutral or beneficial to the creation and maintenance of late-successional habitat.

Using interdisciplinary teams, evaluate other activities not described below and document appropriate guidelines.

Request review by the Regional Ecosystem Office of all activities deemed to have potential adverse effects on Late-Successional Reserve objectives. The Regional Ecosystem Office may develop additional criteria for exempting some additional activities from review.

Silviculture

Plan and implement silvicultural treatments inside Late-Successional Reserves to be beneficial to the creation of late-successional habitat.

If needed to create and maintain late-successional forest conditions, conduct thinning operations in forest stands up to 80 years of age. This will be accomplished by precommercial and/or commercial thinning of stands regardless of origin (e.g., planted after logging or naturally regenerated after fire or blowdown).

Salvage

Limit salvage of dead trees in Late-Successional Reserves to areas where stand-replacing events exceed ten acres in size and canopy closure has been reduced to less than 40 percent.

Retain all standing live trees including those injured (e.g., scorched) but likely to survive.

Retain snags that are likely to persist until late-successional forest conditions have developed and a new stand is again producing large snags.

Retain adequate quantities of coarse woody debris in a new stand so the future stand will contain amounts similar to naturally regenerated stands. Watershed-level or province-level plans will establish appropriate levels of coarse woody debris to be used. Levels will be typical and will not require retention of all material where it is highly concentrated or too small to contribute to coarse woody debris over the long term.

If essential to reduce future risk of fire or insect damage, conduct salvage that does not meet the preceding management actions/direction. Focus on those areas where there is high risk of large scale disturbance.

Remove snags and logs to reduce hazards to humans along roads and trails and in or adjacent to recreation sites. Leave some material where coarse woody debris is inadequate.

After disturbance in younger stands, develop direction for diameter and biomass retention consistent with the intention of achieving late-successional forest conditions. Where green trees, snags, and logs are present following disturbance, the green tree and snag direction will be applied first and completely satisfied where possible. The biomass left in snags can be credited toward the amount of coarse woody debris biomass needed to achieve management objectives.

Retain logs present on the forest floor before a disturbance event.

Retain coarse woody debris to approximate the species composition of the original stand to help replicate pre-existing suitable habitat conditions.

Deviate from these management actions/direction only to provide reasonable access to salvage sites and feasible logging operations. Limit deviations to as small an area as possible.

Road Construction and Maintenance

Construct roads in Late-Successional Reserves if the potential benefits of silviculture, salvage, and other activities exceed the costs of habitat impairment. If new roads are necessary to implement a practice that is otherwise in accordance with these guidelines, they will be kept to a minimum, be routed through unsuitable habitat where possible, and be designed to minimize adverse impacts. Alternative access methods—such as aerial logging—will be considered to provide access for activities in reserves.

Remove trees along rights-of-way if they are a hazard to public safety. Consider leaving material onsite if available coarse woody debris is inadequate. Consider topping of trees as an alternative to felling.

Fuelwood Gathering

Permit fuelwood gathering only in existing cull decks, in areas where green trees are marked by silviculturists for thinning, in areas where blowdown is blocking roads, where trees are removed from the roadside to improve sight distance, and in recently harvested timber sale units where down material will impede scheduled post-sale activities or pose an unacceptable risk of future large scale disturbance. In all cases, these activities will comply with management actions/direction for salvage and silvicultural activities.

Mining

Assess the impacts of ongoing and proposed mining activities in Late-Successional Reserves.

Include stipulations in mineral leases and, when legally possible, require operational constraints for locatable mineral activities to minimize detrimental effects to late-successional habitat.

Developments

Neither construct nor authorize new facilities that may adversely affect Late-Successional Reserves.

Review on a case-by-case basis new development proposals that address public needs or provide significant public benefits. They may be approved when adverse effects can be minimized and mitigated. They will be planned to have the least possible adverse impacts on Late-Successional Reserves.

Locate new developments to avoid degradation of habitat and adverse effects on identified late-successional species.

Retain and maintain existing developments—such as campgrounds, utility corridors, and electronic sites—consistent with other management actions/direction for Late-Successional Reserves.

Remove hazard trees along utility rights-of-way and trails and in other developed areas.

Land Exchanges

Consider land exchanges in Late-Successional Reserves if they provide benefits equal to or better than current conditions.

Consider land exchanges especially to improve area, distribution, and quality (e.g., connectivity, shape, and contribution to biodiversity) of Late-Successional Reserves, especially where public and private lands are intermingled.

Habitat Improvement Projects

Design projects to improve conditions for fish, wildlife, and watersheds if they provide late-successional habitat benefits or if their effect on late-successional associated species is negligible.

Design projects for recovery of threatened or endangered species even if they result in some reduction of habitat quality for other late-successional species.

Design and implement watershed restoration projects consistent with Late-Successional Reserve objectives.

Range Management

In coordination with wildlife and fish biologists, implement range-related management activities that do not adversely affect late-successional habitat.

Through a planning and environmental analysis process appropriate to the action, adjust or eliminate grazing practices that retard or prevent attainment of Late-Successional Reserve objectives.

Evaluate effects of existing and proposed livestock management and handling facilities in Late-Successional Reserves to determine if reserve objectives are met. Where objectives cannot be met, relocate livestock management and/or handling facilities.

Fire Suppression and Prevention

As part of watershed analysis, plan fire management for each Late-Successional Reserve.

Emphasize maintaining late-successional habitat in wildfire suppression plans.

Use minimum impact suppression methods for fuels management in accordance with guidelines for reducing risks of large-scale disturbances.

During actual fire suppression activities, consult an interdisciplinary team to assure that habitat damage is minimized.

Until a fire management plan is completed for a Late-Successional Reserve or group of reserves, suppress wildfire to avoid loss of habitat and to maintain future management options.

Prepare a specific fire management plan prior to any habitat manipulation activities in Late-Successional Reserves. Specify how hazard reduction and other prescribed fire applications meet the objectives of the Late-Successional Reserve. Until the plan is approved, proposed activities will be subject to review by the Regional Ecosystem Office.

Apply prescribed fire in a manner that retains the amount of coarse woody debris determined through watershed analysis.

Limit the size of all wildfires.

Consider allowing some natural fires to burn under prescribed conditions. This decision will be based on additional analysis and planning.

Consider rapidly extinguishing smoldering coarse woody debris and duff.

Special Forest Products

Evaluate whether special forest product harvest activities have adverse effects on Late-Successional Reserve objectives.

Prior to selling special forest products, ensure resource sustainability and protection of other resource values such as special status plant or animal species.

Where special forest product activities are extensive, evaluate whether they have significant effects on late-successional habitat. Restrictions may be appropriate in some cases.

Recreational Uses

Use adjustment measures—such as education, use limitations, traffic control devices, or increased maintenance—when dispersed and developed recreation practices retard or prevent attainment of Late-Successional Reserve objectives.

Rights-of-Way, Contracted Rights, Easements, and Special/Temporary Use Permits

Consider access to nonfederal lands through Late-Successional Reserves and existing right-of-way agreements. Contracted rights, easements, and special/temporary use permits are valid uses in Late-Successional Reserves.

For all new rights-of-way proposals, design mitigation measures to reduce adverse effects on Late-Successional Reserves. Consider alternative routes that avoid Late-Successional Reserves. If rights-of-way must be routed through a reserve, design and locate them to have the least impact on late-successional habitat.

Review all special/temporary use permits. When objectives of Late-Successional Reserves are not being met, attempt to reduce impacts through education or modification of existing permits.

Non-native Species

If introduction of a non-native species is proposed, complete an assessment of impacts and avoid any introduction that would retard or prevent achievement of late-successional objectives.

Evaluate impacts of non-native species (plant and animal) existing within reserves.

Develop plans and recommendations for eliminating or controlling non-native species that are inconsistent with Late-Successional Reserve objectives. Include an analysis of effects of implementing such programs on other species or habitats within Late-Successional Reserves.

Protection Buffers

See the Special Status and SEIS Special Attention Species section.

Matrix (Connectivity/Diversity Blocks and General Forest Management Area)

Objectives

Produce a sustainable supply of timber and other forest commodities.

Provide connectivity (along with other allocations such as Riparian Reserves) between Late-Successional Reserves.

Provide habitat for a variety of organisms associated with both late-successional and younger forests.

Provide for important ecological functions such as dispersal of organisms, carryover of some species from one stand to the next, and maintenance of ecologically valuable structural components such as down logs, snags, and large trees.

Provide early-successional habitat.

Land Use Allocation

In the Matrix, there are approximately 55,300 acres of BLM-administered land in the General Forest Management Area and 6,600 acres in Connectivity/Diversity Blocks. Connectivity/Diversity Blocks vary in size and are distributed throughout the Matrix (see Map 2-3).

Management Actions/Direction

Apply the management actions/direction in the Special Status and SEIS Special Attention Species section.

Conduct timber harvest and other silvicultural activities in that portion of the Matrix with suitable forest lands, according to management actions/direction summarized below and in the Timber section.

Provide a renewable supply of large down logs well distributed across the Matrix landscape in a manner that meets the needs of species and provides for ecological functions. Down logs will reflect the species mix of the original stand.

1. Leave 120 linear feet of logs per acre greater than or equal to 16 inches in diameter and 16 feet long. Decay class 1 and 2 logs will be credited toward the total. Down logs will reflect the species mix of the original stand. Where this management action/direction cannot be met with existing coarse woody debris, merchantable material will be used to make up the deficit.

2. In areas of partial harvest, apply the same basic management actions/direction, but they can be modified to reflect the timing of stand development cycles where partial harvest is practiced.

3. Retain coarse woody debris already on the ground and protect it to the greatest extent possible from disturbance during treatment (e.g., slash burning and yarding) that might otherwise destroy the integrity of the substrate.

Retain green trees and snags throughout the General Forest Management Area.

1. Retain 6 to 8 green conifer trees per acre in regeneration harvest units.

2. Retain snags within a timber harvest unit at levels sufficient to support species of cavity-nesting birds at 40 percent of potential population levels. Meet the 40 percent minimum throughout the Matrix with per acre requirements met on average areas no larger than 40 acres.

3. In addition to the green tree retention management action/direction, retain green trees for snag recruitment in timber harvest units where there is an identified, near-term (less than 3 decades) snag deficit. These trees do not count toward green-tree retention requirements.

Provide Connectivity/Diversity Blocks spaced throughout the Matrix. Manage the blocks as follows:

1. Maintain 25 to 30 percent of each block in late-successional forest at any point in time. Riparian Reserves and other allocations with late-successional forest count toward this percentage. Blocks may be comprised of contiguous or noncontiguous BLM-administered land. The size and arrangement of habitat within a block will provide effective habitat to the extent possible.
2. Manage available forest land within each block on a 150-year area control rotation.
3. When an area is regeneration harvested, retain 12 to 18 green trees per acre.

Modify site treatment practices, particularly the use of fire and pesticides, and modify harvest methods to minimize soil and litter disturbance. Plan and implement treatments to:

1. Minimize intensive burning, unless appropriate for certain specific habitats, communities, or stand conditions. Prescribed fires should be planned to minimize the consumption of litter and coarse woody debris.
2. Minimize soil and litter disturbance that may occur as a result of yarding and operation of heavy equipment.
3. Reduce the intensity and frequency of site treatments.

Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands. Protection of these stands could be modified in the future when other portions of a watershed have recovered to the point where they could replace the ecological roles of these stands.

Retain 100 acres of the best northern spotted owl habitat as close as possible to a nest site or owl activity center for all known (as of January 1, 1994) spotted owl activity centers.

Conform all management activities within the range of Port-Orford cedar to the guidelines described in the *BLM Port-Orford cedar Management Policies* to mitigate damage caused by *Phytophthora lateralis.* Site-specific analysis for projects within the range of Port-Orford cedar will consider possible effects on the species.

Additional information about Matrix management is in the SEIS ROD (Appendix F).

Resource Programs

The following section includes objectives, land use allocations, and management actions/direction for the resource uses and programs that BLM manages in the Coos Bay District. Some of the management actions/direction in the previous land use allocation section are repeated in this section. The intent of this duplication is to give readers a package of related management guidance in one location.

Air Quality

Objectives

Continue efforts to meet National Ambient Air Quality Standards, Prevention of Significant Deterioration goals, and the visibility protection plan.

Maintain and enhance air quality and visibility in a manner consistent with the Clean Air Act and the State Implementation Plan.

Reduce the potential for wildfire emissions through the use of prescribed fire and other fuels management techniques.

Land Use Allocations

None.

Management Actions/Direction

By the year 2000, reduce particulate matter emissions and impacts from prescribed burning by

50 percent from the baseline period (1976-1979). This will be accomplished by planning, conducting, monitoring, and, if necessary, adjusting prescribed fire activities in accordance with the Oregon State Implementation Plan and the Oregon Smoke Management Plan (see Fire section).

Reduce broadcast burning in favor of lower intensity under burning. Use emission reduction mitigation measures and smoke dispersal techniques to the greatest extent practical. Wildfire hazard reduction, site preparation, and the use of prescribed fire for species habitat mitigation will be implemented in a manner consistent with ecosystem management.

Where needed, use dust abatement measures on roads during BLM timber harvest operations or other BLM commodity hauling activity. Encourage dust abatement measures when haulers use BLM roads under permits and right-of-way agreements.

Promote burning of dry fuelwood by making available copies of Oregon Department of Environmental Quality publications to fuelwood purchasers.

Consider alternative emission reduction techniques whenever they are compatible with land allocation objectives and other management actions/direction. See Air Quality Analysis section of the FSEIS for alternative treatments that may be considered during fuels management project design.

Water and Soils

Objectives

See objectives for Aquatic Conservation Strategy, Riparian Reserves, and Key Watersheds.

As directed by the Clean Water Act, comply with state water quality requirements to restore and maintain water quality for the protection of recognized beneficial uses of the Mid-Coast, Umpqua South Coast, and Rogue basins.

Improve and/or maintain soil productivity.

Land Use Allocations

There are no land use allocations specific to water quality or soils. However, Riparian Reserves, Key Watershed provisions, Administratively Withdrawn areas, and timber production capability classifications will assist in meeting water quality and soils management objectives.

Management Actions/Direction

General

Improve and/or maintain soil and water conditions by closing selected areas to off-highway vehicle use and/or limiting such use to existing or designated roads and trails. See Recreation, Off-Highway Vehicles, for additional details.

Water

See Management Actions/Direction for Riparian Reserves and Key Watersheds (located in Aquatic Conservation Strategy section).

Continue to implement a nonpoint source management program in cooperation with the U. S. Environmental Protection Agency and the Oregon Department of Environmental Quality.

Continue coordination with the Oregon Department of Environmental Quality for implementation of best management practices that protect beneficial uses of water.

Ensure consistency of management activities with Oregon's *Statewide Water Quality Management Plan* for forest practices and with Oregon's water quality criteria and guidelines (Oregon Administrative Rule 340-41).

Protect floodplains and wetlands in accordance with Executive Orders 11988 and 11990 and BLM's *Riparian-Wetlands Initiative for the 1990s* (USDI, BLM 1991a).

Design and implement watershed restoration projects that promote long-term ecological integrity of ecosystems, conserve the genetic integrity of native species, and attain Aquatic Conservation Strategy objectives. See Aquatic Conservation Strategy for additional guidance.

Cooperate with federal, state, local, and tribal agencies and private landowners to develop watershed-based coordinated resource management plans or other cooperative agreements to meet Aquatic Conservation Strategy objectives.

Prevent watershed degradation—rather than using mitigation or planned restoration—to correct foreseeable problems caused by management activities. See Best Management Practices (Appendix H) for additional guidance.

Identify and attempt to obtain instream flows needed to maintain riparian resources, channel conditions, aquatic habitat, and water quality.

Locate water-drafting sites to minimize adverse effects on stream channel stability, sedimentation, and instream flows needed to maintain riparian resources, channel conditions, and fish habitat.

Apply herbicides, insecticides, and other chemicals in a manner that avoids impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives.

Use land acquisition, exchange, and conservation easements to meet Aquatic Conservation Strategy objectives.

Apply for water rights to support the needs for fire suppression, construction/maintenance (e.g., pump chances, water holes and reservoirs), recreation, and other programs.

Soils

Apply best management practices during all ground- and vegetation-disturbing activities. See Appendix H for a list of practices.

Minimize disturbance of identified fragile sites (Nonsuitable Woodlands and Suitable Woodlands). Figure 2-1 is an illustration of how fragile sites are defined and classified in the Timber Production Capability Classification System.

Apply fertilizer in the Matrix to enhance soil productivity.

Wildlife Habitat

Objectives

See objectives for Late-Successional Reserves, Riparian Reserves, and the Matrix.

Enhance and maintain biological diversity and ecosystem health to contribute to healthy wildlife populations.

Land Use Allocations

The land use allocations in this proposed resource management plan are designed to benefit wildlife species—in the aggregate— that use the various seral stages and other habitat areas of the forest.

Management Actions/Direction

All Land Use Allocations

Use the watershed analysis process to address wildlife habitat issues for individual watersheds. The analysis will help to resolve any concerns identified in applying management actions/direction in this section and those in the Special Status and SEIS Special Attention Species section. Where appropriate, wildlife habitat enhancement opportunities will be identified through this process.

Coordinate with the Oregon Department of Fish and Wildlife during planning and implementation of wildlife habitat enhancement projects.

Cooperate with federal, tribal, and state wildlife management agencies to identify and eliminate impacts associated with habitat manipulation, poaching, and other activities that threaten the continued existence and distribution of native wildlife inhabiting federal lands.

Management Actions/Direction

Riparian Reserves

Design and implement wildlife habitat restoration and enhancement activities in a manner that contributes to attainment of Aquatic Conservation Strategy objectives.

Design, construct, and operate wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of Aquatic Conservation Strategy objectives. For existing wildlife interpretive and other user-enhancement facilities inside Riparian Reserves, ensure that Aquatic Conservation Strategy objectives are met. Where Aquatic Conservation Strategy objectives cannot be met, relocate or close such facilities.

Cooperate with federal, tribal, and state wildlife management agencies to identify and eliminate wild ungulate impacts that are inconsistent with attainment of Aquatic Conservation Strategy objectives.

Management Actions/Direction

Late-Successional Reserves

Design projects to improve conditions for wildlife if they provide late-successional habitat benefits or if their effect on late-successional associated species is negligible.

If introduction of a non-native species is proposed, complete an assessment of impacts and avoid any introduction that would retard or prevent achievement of Late-Successional Reserve objectives.

Evaluate impacts of non-native species existing within Late-Successional Reserves.

Develop plans and recommendations for eliminating or controlling non-native species that are inconsistent with Late-Successional Reserve objectives. Include an analysis of effects of implementing such programs on other species within Late-Successional Reserves.

Management Actions/Direction

Matrix, including General Forest Management Area and Connectivity/Diversity Blocks

Retain snags within a timber harvest unit at levels sufficient to support species of cavity-nesting birds at 40 percent of potential population levels. Meet the 40 percent minimum throughout the Matrix with per acre requirements met on average areas no larger than 40 acres.

General Forest Management Area

Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands. Protection of these stands could be modified in the future when other portions of a watershed have recovered to the point where they could replace the ecological roles of these stands.

Retain 6-8 green conifer trees per acre after regeneration harvest. Retained trees will be distributed in variable patterns (e.g., single trees, clumps and stringers) to contribute to stand diversity.

In addition to the green tree retention management action/direction, retain green trees for snag recruitment in harvest units where there is an identified, near-term (less than 3 decades) snag deficit. These trees do not count toward green-tree retention requirements.

Leave 120 linear feet of logs per acre greater than or equal to 16 inches in diameter and 16 feet long. Existing decay class 1 and 2 logs count toward this requirement. Down logs will reflect the species mix of original stands. Where this management action/direction cannot be met with existing coarse woody debris, merchantable material will be used to make up the deficit.

Connectivity/Diversity Blocks

Provide Connectivity/Diversity Blocks spaced throughout the BLM land base. Manage the blocks as follows:

1. Maintain 25 to 30 percent of each block in late-successional forest at any point in time. The percentage of habitat will include habitat in other allocations, such as Riparian Reserves. Blocks may be comprised of contiguous or noncontiguous BLM-administered land. The size and arrangement of habitat within a block should provide effective habitat to the extent possible.
2. Retain 12-18 green conifer trees per acre when an area is regeneration harvested. Distribute the retained trees in variable patterns (e.g., single trees, clumps and stringers) to contribute to stand diversity. The management goal for the retained trees and subsequent density management would be the recovery of old-growth conditions in approximately 100 to 120 years.
3. Leave 120 linear feet of logs per acre greater than or equal to 16 inches in diameter and 16 feet long. Existing decay class 1 and 2 logs will be credited toward this total. Down logs will reflect the species mix of original stands. Where this management action/direction cannot be met with existing coarse woody debris, merchantable material will be used to make up the deficit.

Special Habitats

Using interdisciplinary teams, identify special habitat areas and determine relevant values for protection or management on a case-by-case basis. Of particular importance in these determinations will be the habitat of species that have protection buffers specified in the SEIS ROD.

Use management practices—including fire—to obtain desired vegetation conditions in special habitats.

Raptors and Great Blue Herons

Maintain the integrity of nest sites, centers of activity, or rookeries.

Install nesting platforms, nest boxes, and other structures to enhance habitat as appropriate.

Establish the following buffers:

Species	Buffer
Osprey	1 to 5 acres depending on site characteristics
Golden Eagle	Protect sufficient acreage around nest site to avoid human disturbance
Red-tailed Hawk	Up to 1 acre around nest site
Sharp-shinned Hawk	10-acre management area surrounding nest site
Cooper's Hawk	15-acre management area surrounding nest site
Great Blue Heron/ Great Egret	250-yard no-disturbance buffer around heron and egret colonies

Roosevelt Elk

In elk habitat areas, close and rehabilitate roads unneeded for continued resource management or use. Within the ODFW Tioga Big Game Management Area (approximately 190,200 acres), the goal will be to maintain 1.1 miles of road per section per watershed with a maximum density of 2.9 miles per section per watershed when all classes of road are considered. In the remainder of the district, the goal will be to maintain a density of 2.9 miles of road per section per watershed. Roads to be closed or with restricted access would be primarily local roads and secondary or collector roads.

Close the following habitat areas to public motorized vehicle use: Dean Creek Elk Viewing Area, except for the developed parking area and uncontrolled access roads.

Use seasonal restrictions on public use and management activities where needed to minimize disturbance and harassment of herds.

Keep major game trails clear of slash accumulations caused by thinning projects.

Conduct forage seeding in habitat areas with appropriate seed beds and where compatible with other management objectives.

Maintain visual barriers along roads in high use big game areas.

Consider utilization of landings and roads for the creation of temporary (not to exceed 20 years) or permanent foraging areas where forage is lacking.

Fish Habitat

Objectives

See Aquatic Conservation Strategy objectives.

Maintain or enhance the fisheries potential of streams and other waters consistent with BLM's Fish and Wildlife 2000 Plan, the Bring Back the Natives initiative, and other nationwide initiatives.

Promote the rehabilitation and protection of fish stocks at risk and their habitat.

Land Use Allocations

There are no specific land use allocations for the fisheries resource. However, Riparian Reserves, Key Watershed provisions, and timber production capability classifications will assist in meeting fish habitat management objectives.

Management Actions/Direction

Riparian Reserves

Design and implement fish habitat restoration and enhancement activities in a manner that contributes to attainment of Aquatic Conservation Strategy objectives.

Design, construct and operate fish interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of Aquatic Conservation Strategy objectives. For existing fish interpretative and other user-enhancement facilities inside Riparian Reserves, ensure that Aquatic

Conservation Strategy objectives are met. Where Aquatic Conservation Strategy objectives cannot be met, relocate or close such facilities.

Cooperate with federal, tribal, and state fish management agencies to identify and eliminate impacts associated with habitat manipulation, fish stocking, harvest, and poaching that threaten the continued existence and distribution of native fish stocks inhabiting federal lands.

Cooperate with federal, tribal, and state wildlife management agencies to identify and eliminate wild ungulate impacts that are inconsistent with attainment of Aquatic Conservation Strategy objectives.

Management Actions/Direction

Late-Successional Reserves

Design projects to improve conditions for fish if the projects provide late-successional habitat benefits or if their effect on late-successional associated species is negligible.

Management Actions/Direction

All Land Use Allocations

Apply the management actions/direction in the Special Status and SEIS Special Attention Species section.

Use the watershed analysis process to address at-risk fish species and stocks and their habitat for individual watersheds. Where appropriate, fish habitat enhancement opportunities will be identified through this process.

Coordinate with the Oregon Department of Fish and Wildlife Wild Fish Policy during planning and implementation of fish habitat enhancement projects. Priority will be given to watersheds supporting at-risk fish species and stocks and those requiring extensive restoration.

As identified through watershed analysis, rehabilitate streams and other waters to enhance natural populations of anadromous and resident fish. Possible rehabilitation measures would include, but not be limited to, fish passage improvements, instream structures using boulders and log placement to create spawning and rearing habitat, placement of fine and coarse materials for over-wintering habitat, and riparian rehabilitation to establish or release existing coniferous trees. See Table 2-3 for a list of possible fish enhancement projects.

See the Special Status and SEIS Special Attention Species section and Best Management Practices (Appendix H) for additional fish habitat management actions/direction and conservation practices.

Special Status and SEIS Special Attention Species Habitat

Objectives

See the objectives for Late-Successional Reserves, Riparian Reserves, Matrix, and Special Areas.

Protect, manage, and conserve federal listed and proposed species and their habitats to achieve their recovery in compliance with the Endangered Species Act, approved recovery plans, and Bureau special status species policies.

Manage for the conservation of federal candidate and Bureau sensitive species and their habitats so as not to contribute to the need to list and to recover the species.

Manage for the conservation of state listed species and their habitats to assist the state in achieving management objectives.

Protect and manage assessment species where possible so as to not elevate their status to any higher level of concern.

Protect SEIS special attention species so as not to elevate their status to any higher level of concern.

Maintain or restore community structure, species composition, and ecological processes of special status plant and animal habitat.

Land Use Allocations

All of the major land allocations in this plan are designed in part to benefit special status species in the aggregate.

Management Actions/Direction

Late-Successional Reserves

Design projects for recovery of threatened or endangered animal and plant species even if they result in some reduction of habitat quality for late-

Table 2-3. Possible Fish Enhancement Projects

Priority	Stream	Project Type
1 [1,2]	Upper North Fork Coquille River	Rearing pools and winter rearing habitat; riparian enhancement.
2 [2]	Baker Creek	Rearing habitat.
3 [2]	Paradise Creek	Winter rearing habitat improvement.
4	Middle Creek	Rearing habitat.
5	Elk Creek	Rearing habitat.
6	Yankee Run Creek	Spawning and rearing habitat.
7	Sandy Creek	Winter rearing-deep pool complex.
8	Camas Creek	Rearing habitat for trout.
9	Steel Creek	Spawning and rearing habitat.
10	China Creek	Culvert replacement.
11	Alder Creek	Rearing pools and winter rearing habitat.
12 [2]	South Sisters Creek	Spawning and rearing habitat.
13	Crane Creek	Rearing pools and winter rearing habitat.
14	West Fork Brummit Creek	Riparian enhancement.
15	Frenchie Creek	Passage for anadromous fish.

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[1] Projects may vary by alternative should river be found suitable for inclusion in Wild and Scenic River System.

[2] Projects located within Key Watersheds.

Note: Projects listed are general in nature. Specific project proposals will be developed through the watershed analysis process.

successional species. These projects will be designed for least impact to late-successional species.

Management Actions/Direction

All Land Use Allocations

Special Status Species

Review all proposed actions to determine whether or not special status species occupy or use the affected area or if habitat for such species is affected.

Conduct field surveys according to protocols and other established procedures. This includes surveying during the proper season unless surveys are deemed unnecessary through watershed analysis, project planning, and environmental assessment. For example, field surveys may not be conducted in all cases depending on the number and timing of previous surveys conducted, whether previous surveys looked for all species that a new survey would, and the likelihood of potential habitat. The intensity of field surveys will also vary depending on the same factors.

Consult/conference with or request technical assistance from the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) for any proposed action that may affect federal listed or proposed species or their critical or essential habitat. Based on the results of consultation/conferencing, modify, relocate, or abandon the proposed action.

Coordinate with the USFWS, NMFS, and other appropriate agencies and organizations and jointly endeavor to recover federal listed and proposed plant and animal species and their habitats.

Modify, relocate, or abandon a proposed action to avoid contributing to the need to list federal candidate species, state listed species, Bureau sensitive species, or their habitats.

Coordinate and cooperate with the State of Oregon to conserve state listed species.

Identify impacts of proposed actions, if any, to Bureau sensitive and assessment species as a whole and clearly describe impacts in environmental analyses. As funding permits and as species conservation dictates, actively manage the Bureau sensitive and assessment species.

Retain under federal management, or other appropriate management organization, habitat essential for the survival or recovery of listed and proposed species. Retain habitat of proposed, candidate, or Bureau sensitive species where disposal would contribute to the need to list the species.

Where appropriate opportunities exist, acquire land to contribute to recovery, reduce the need to list, or enhance special status species habitat.

Coordinate with other agencies and groups in management of species across landscapes. Coordination will be accomplished through conservation plans or similar agreements that identify actions to conserve single or multiple species and/or habitats. Such strategies could preclude the need for intensive inventories or modifications to some projects where the conservation plan provides adequate protection for the species and meets the intent of policy.

Where plans exist for species no longer on the special status list, continue with the prescribed conservation actions if determined to be required to avoid relisting or further consideration for listing. In the case of interagency plans or agreements, this determination will be mutually decided. Such plans may be modified as needed based on adequacy of existing range-wide conditions and conservation management.

Pursue opportunities for public education about conservation of species.

Where appropriate, pursue opportunities to increase the number of populations of species under BLM management through land acquisition and/or species reintroduction in coordination with other responsible agencies.

SEIS Special Attention Species

Survey and Manage

Implement the survey and manage provision of the SEIS ROD within the range of SEIS special attention species and the particular habitats that they are known to occupy. Appendix G shows which species are covered by this provision, and which of the following four categories and management actions/direction are to be applied to each:

1. Manage known sites (highest priority).

   a. Acquire and manage information on known sites, make it available to all project planners, and use it to design or modify activities.

   b. Protect known sites. For some species, apply specific management treatments such as prescribed fire.

   c. For rare and endemic fungus species, temporarily withdraw 160 acres around known sites from ground-disturbing activities until the sites can be thoroughly surveyed and site-specific measures prescribed.

2. Survey prior to activities and manage sites.

   a. Continue existing efforts to survey and manage rare and sensitive species habitat.

   b. For species without survey protocols, start immediately to design protocols and implement surveys.

   c. Within the known or suspected ranges and within the habitat types of vegetation communities associated with the species, survey for:

      - Del Norte salamander
      - Siskiyou Mountains salamander
      - Red tree voles

      These surveys will precede the design of all ground-disturbing activities that will be implemented in 1997 or later.

   d. For the other species listed in Appendix G, begin development of survey protocols promptly and proceed with surveys as soon as possible. These surveys will be completed prior to ground-disturbing activities that will be implemented in Fiscal Year 1999 or later. Work to establish habitat requirements and survey protocols may be prioritized relative to the estimated threats to the species as reflected in the SEIS.

   e. Conduct surveys at a scale most appropriate to the species.

   f. Develop management actions/direction to manage habitat for the species on sites where they are located.

   g. Incorporate survey protocols and proposed site management in interagency conservation strategies developed as part of ongoing planning efforts coordinated by the Regional Ecosystem Office.

3. Conduct extensive surveys and manage sites.

   a. Conduct extensive surveys for the species to find high-priority sites for species management. Specific surveys prior to ground-disturbing activities are not a requirement.

   b. Conduct surveys according to a schedule that is most efficient and identify sites for protection at that time.

   c. Design these surveys for efficiency and develop standardized protocols.

   d. Begin these surveys by 1996.

4. Conduct general regional surveys.

   a. Survey to acquire additional information and to determine necessary levels of protection for arthropods, fungi species not classed as rare and endemic, bryophytes, and lichens.

   b. Initiate these surveys no later than Fiscal Year 1996 and complete them within 10 years.

Protection Buffers

Provide protection buffers for specific rare and locally endemic species and SEIS special attention species in the upland forest matrix. Species occurring in the district are listed below. These species are likely to be assured viability if they occur within reserves. However, there might be occupied locations outside reserves that will be important to protect as well.

Apply the following management actions/direction:

1. Develop survey protocols that will ensure a high likelihood of locating sites occupied by these species.

2. Following development of survey protocols and prior to ground-disturbing activities, conduct surveys within the known or suspected ranges of the species and within the habitat types or vegetation communities occupied by the species. See the previous Survey and Manage section for an implementation schedule.

3. Manage known habitat of special attention species requiring protection buffers as follows:

   a. Nonvascular plants

      Aleuria rhenana

      (1) Conduct ecological studies and surveys to determine localities. Protect known populations if surveys continue to indicate that the population is rare.

      (2) Defer ground-disturbing activities.

      The implementation schedule for this species is the same as for survey and manage components 1 and 2.

      Otidea leporina, O. onotica,* and *O. smithii

      (1) Protect older forests from ground disturbance where the species are located.

      The implementation schedule for these species is the same as for survey and manage components 1 and 2.

      Buxbaumia piperi

      (1) Survey to determine presence and distribution.

      (2) Where located, maintain decay class 3, 4, and 5 logs and greater than 70 percent closed-canopy forest habitats for shade.

      The implementation schedule for this species is the same as for survey and manage components 1 and 3.

      Sarcosoma mexicana

      (1) Survey for locations and protect deep litter layers of older forests where found.

      (2) Defer prescribed burning of understory or other activities that would not retain a deep litter layer.

      The implementation schedule for this species is the same as for survey and manage component 3.

   b. Amphibians

      Siskiyou Mountain Salamander

      (1) Avoid disturbance of talus throughout occupied sites, especially on moist, north-facing slopes.

      (2) Retain around the outer periphery of known sites a buffer of at least the height of one site potential tree or 100 feet horizontal distance, whichever is greater.

      Del Norte Salamander

      (1) Avoid any ground-disturbing activity that would disrupt the talus layer where this species occurs.

      (2) Once sites are identified, maintain 40 percent canopy closure of trees within the site and within a buffer of at least the height of one site potential tree or 100 feet horizontal distance, whichever is greater, surrounding the site.

      (3) Conduct partial harvest if 40 percent canopy closure can be retained. In such cases, logging will be conducted using helicopters or high-lead cable systems to avoid compaction or disturbance of the talus.

      The implementation schedule for this species is the same as for survey and manage components 1 and 2.

   c. Birds

      Black-backed Woodpecker

      1. Maintain adequate numbers of large snags and green-tree replacements for future snags within this species range in appropriate forest types. Where feasible, green-tree replacements for future snags can be left in groups to reduce blowdown.

      2. Where safety considerations permit, retain all snags 20 inches or larger in dbh.

      3. For the longer term, provide for sufficient numbers of green trees to provide for 100 percent population potential for this species. For the Black-backed

Woodpecker this equates to 0.12 conifer snags per acre in forest habitats. Snags must be at least 17 inches in dbh or larger and in the hard decay stages.

For newly discovered habitat of other special attention species requiring protection buffers, apply the management action/direction in the SEIS Record of Decision.

Animals

Roosting Bats

Conduct surveys to determine the presence of roosting bats, including fringed myotis, silver-haired bats, long-eared myotis, long-legged myotis, and pallid bats. Surveys will be conducted according to protocol defined in the SEIS ROD and in any subsequent revisions to the protocol.

As an interim measure, allow no timber harvest within 250 feet of sites containing bats. Develop mitigation measures in project or activity plans involving these sites. The intent of these measures is to protect sites from destruction, vandalism, disturbance from road construction or blasting, or any other activity that could change cave or mine temperatures or drainage patterns.

When Townsend's big-eared bats are found on federal land, notify the Oregon Department of Fish and Wildlife. For any located sites, develop management prescriptions that include special consideration for potential impacts on this species.

Listed and Proposed Threatened and Endangered Species

General

Implement the land use allocations and management actions/direction of this proposed resource management plan that are designed to enhance and maintain habitat for threatened and endangered species.

Northern Spotted Owl (federal threatened species)

In the Matrix, retain 100 acres of the best northern spotted owl habitat as close as possible to a nest site or owl activity center for all known (as of January 1, 1994) spotted owl activity centers.

Fall no trees within 0.25 mile of all active northern spotted owl nest sites from approximately March 1 to September 30 to avoid disturbance and harm to young owls.

With minor exceptions, restrict human activities that could disturb owl nesting—especially use of large power equipment— within 0.25 mile of all active spotted owl nest sites from approximately March 1 to September 30. Restrictions on activities would usually not be required for owl nests and activity centers located near roads or in other areas of permanent human activity.

Marbled Murrelet (federal threatened species)

Conduct two years of survey prior to any human disturbance of marbled murrelet habitat.

Protect contiguous existing and recruitment habitat for marbled murrelets (i.e., stands that are capable of becoming marbled murrelet habitat within 25 years) within a 0.5 mile radius of any site where the birds' behavior indicates occupation (e.g., active nest, fecal ring or eggshell fragments, and birds flying below, through, into, or out of the forest canopy within or adjacent to a stand).

Do not conduct nor allow harvest of timber within occupied marbled murrelet habitat—at least until completion of the Marbled Murrelet Recovery Plan.

During silvicultural treatments of non-habitat within the 0.5-mile circle, protect or enhance suitable or replacement habitat.

Amend or revise management direction as appropriate when the recovery plan is completed.

Bald Eagle (federal threatened species)

Comply with the Pacific Bald Eagle Recovery and Implementation Plans and existing, site-specific habitat management plans.

Provide a 440-yard radius buffer around known and future nest sites. Protect all snags within 550 yards of nest and roost sites. Consider the acquisition of up to 120 acres every two miles along 5th order and larger streams where no publically owned lands exist. Acquire privately-owned lands surrounding bald eagle nests when possible. Manage immediately adjacent lands to reduce the fire hazard in nesting areas.

Peregrine Falcon (federal endangered species)

Comply with the Peregrine Falcon Recovery Plan and existing, site-specific habitat management plans.

Aleutian Canada Goose (federal threatened species)

Comply with the Aleutian Canada Goose Recovery Plan and the New River ACEC Management Plan. Continue to explore opportunities for acquiring potential habitat in the New River area. Coordinate with the USFWS to acquire habitat and population information on Aleutian Canada geese in the New River area.

Western Snowy Plover (federal threatened species)

Coordinate with the Snowy Plover Working Group and the Recovery Team, when established, for management of plover habitat on district lands on the North Spit of Coos Bay and in the New River area. Consider acquisition of parcels within the district that could facilitate recovery of the species. Protect nesting areas from disturbance from human activities and predation. Continue to gather habitat and nesting information on the species in coordination with ODFW, the Oregon Heritage Program, the Dunes National Recreation Area, and USFWS. Continue to improve and maintain habitat for the snowy plover on the North Spit of Coos Bay and at New River through direction provided by the Snowy Plover Working Group and in line with the Recovery Plan when approved.

Plants (Listed and Proposed Endangered and Threatened Species)

General

Implement the land use allocations and management actions/direction of this proposed resource management plan that are designed to enhance and maintain habitat for all endangered and threatened species.

Western lily (*Liiium occidentale*) (federal proposed)

Participate in recovery efforts for the western lily. If populations are found on BLM-administered lands, management action/direction will be developed.

Participate in research efforts that may help recover the species, including experimental introduction, seed collection and propagation, inventories, and population monitoring.

Special Areas

Objectives

Retain existing research natural areas and existing areas of critical environmental concern that meet the test of continuing need for designation. Retain other special areas. Provide new special areas where needed to maintain or protect important values.

Maintain, protect, or restore relevant and important values of areas of critical environmental concern.

Preserve, protect, or restore native species composition and ecological processes of biological communities (including Oregon Natural Heritage Plan terrestrial and aquatic cells) in research natural areas. These areas will be available for short- or long-term scientific study, research, and education and will serve as a baseline to measure human impacts on natural systems.

Provide and maintain environmental education opportunities in environmental education areas. Control uses to minimize disturbance of educational values.

Land Use Allocations

Special Area Category	Number	Acres
Areas of Critical Environmental Concern (This category includes only areas with ACEC designation. Double designated areas—such as areas of critical environmental concern/research natural areas—are not included in this entry.)	10	8,830
Areas of Critical Environmental Concern/ Research Natural Areas	1	570
Environmental Education Areas	1	70

See Map 2-4 and Table 2-4 for locations and site-specific existing and proposed special area acres, respectively.

Management Actions/Direction

Manage special areas for the previously designated areas (Cherry Creek ACEC/RNA, New River ACEC, Powers Environmental Education Area) in accordance with their guidelines in Table 2-4 until management plans have been completed.

Develop site-specific management plans for new special areas as needed. Protect resource values in new areas pending completion of management plans (see Table 2-4 for management guidelines). Management plans will address other possible actions such as land acquisition, recreational

Table 2-4. Management of Existing and New Special Areas

Name	Acres	Off-Highway Vehicle Designation	Leasable Mineral Entry	Locatable/ Salable Mineral Entry	Timber Harvest
Existing					
Cherry Creek RNA/ACEC	570	Closed	Open-NSO	Closed	Not Available
New River ACEC	880	Closed/ Limited	Open-NSO	Closed	Not Available
Powers Environ. Education	70	Closed	Open-NSO	Closed	Not Available
New					
Wassen Creek ACEC	3,440	Limited	Open-NSO	Closed	Not Available
North Spit ACEC	580	Limited	Open-NSO	Closed	Not Available
North Fork Coquille River ACEC	290	Limited	Open-NSO	Closed	Not Available
Tioga Creek ACEC	40	Closed	Open-NSO	Closed	Not Available
China Wall ACEC	240	Closed	Open-NSO	Closed	Not Available
Upper Rock Creek ACEC	460	Limited	Open-NSO	Closed	Not Available
North Fork Hunter Creek ACEC	1,730	Limited	Open-NSO	Closed	Not Available
Hunter Creek Bog ACEC	570	Limited	Open-NSO	Closed	Not Available
North Fork Chetco River ACEC	600	Limited	Open-NSO	Closed	Not Available

Abbreviations used in this table:
ACEC = Area of Critical Environmental Concern
RNA = Research Natural Area
NSO = No Surface Occupancy

development, use of prescribed fire, visitor use, and interpretation.

Cultural Resources Including American Indian Values

Objectives

Identify cultural resource localities and manage them for public, scientific, and cultural heritage purposes.

Conserve and protect designated cultural resources for future generations.

Support ecosystem management by providing information on long-term environmental change and the interactions between humans and the environment in the past.

Fulfill responsibilities to appropriate American Indian groups regarding heritage and religious concerns.

Land Use Allocations

Sites with significant values will be protected from management actions and from vandalism to the extent possible. Cultural resource sites are not mapped in this plan or described in detail due to the sensitivity of resource values.

The Coos Bay District manages five cultural resource sites on the National Register of Historic Places.

Management Actions/Direction

Evaluate cultural resource sites to determine their potential for contributing to public, cultural heritage, and/or scientific purposes.

Investigate landscape features such as bogs, ponds, packrat middens, and cultural sites that contain information regarding long-term environmental change.

Develop mechanisms for describing past landscapes and the role of humans in shaping those landscapes,

Address the management of cultural resources through watershed analyses and project plans.

Develop educational and interpretive programs—as part of the Adventures in the Past initiative—to increase public awareness and appreciation of cultural resources.

Develop partnerships with local American Indian groups and other interested parties to accomplish cultural resource objectives.

Take appropriate law enforcement or other actions when necessary to protect cultural resources. Such actions may include physical protection measures such as riprapping and barrier installations to reduce deterioration.

Develop memoranda of understanding with federally recognized Indian tribes and other Indian groups to provide for appropriate consideration of their heritage and religious concerns. These groups may include the Coquille Indian Tribe and the Confederated Indian Tribes of the Siletz.

Acquire significant cultural resource properties for public, cultural heritage, and scientific purposes.

Visual Resources

Objectives

Manage all BLM-administered land to meet the following visual quality objectives:

- VRM Class I areas: Preserve the existing character of landscapes.
- VRM Class II areas: Retain the existing character of landscapes.
- VRM Class III areas: Partially retain the existing character of landscapes.
- VRM Class IV areas: Allow major modifications of existing character of landscapes.

Emphasize management of scenic resources in selected high-use areas to retain or preserve scenic quality.

Land Use Allocations

VRM Class	Approximate Acres
I	600
II	6,600
III	14,700
IV	307,700

See Map 2-5 for the location of visual resource management classes.

VRM Class I: The Congressionally-designated Squaw Island Wilderness, Zwagg Island, and North Sisters Rocks Wilderness Study Areas; and Cherry Creek Area of Critical Environmental Concern/ Research Natural Area.

VRM Class II or Class III (see Map 2-5): Available forest land adjacent (within 0.25 mile) to developed recreation sites, state and federal highways, and state scenic waterways would be managed as inventoried. Representative Class II areas include lands along Highway 101, the Umpqua and Rogue River corridors, Mill Creek Road, and the Coquille Valley. Lands adjacent to most county roads in rural residential areas (such as along the Coos River, Coos Bay Wagon Road, and Smith River Road) are primarily Class III.

VRM Class IV: All other available forest land except as noted under Rural Interface Area Management. This includes lands within the General Forest Management Area and Connectivity/Diversity Blocks as well as lands adjacent to most logging access roads and other seldom seen areas.

The remaining lands (non-forest, nonsuitable woodland, suitable woodland-low site, and lands allocated for uses other than for timber production) would be managed as inventoried.

Management Actions/Direction

Address visual resource management issues when conducting watershed analysis.

Use the visual resource contrast rating system during project level planning to determine whether or not proposed activities will meet VRM objectives. Use mitigation measures to reduce visual contrasts.

Provide for natural ecological changes in VRM Class I areas. Some very limited management activities may occur in these areas. The level of change to the characteristic landscape should be very low and must not attract attention. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape.

Manage VRM Class II lands for low levels of change to the characteristic landscape. Management activities may be seen but should not attract the attention of the casual observer. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape.

Manage VRM Class III lands for moderate levels of change to the characteristic landscape. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape.

Manage VRM Class IV lands for moderate levels of change to the characteristic landscape. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the effect of these activities through careful location, minimal disturbance, and repeating the basic elements of form, line, color, and texture.

Wild and Scenic Rivers

Objectives

Manage designated segments of the National Wild and Scenic Rivers System by protecting their outstandingly remarkable values and maintain and enhance the natural integrity of river-related values.

Find important and manageable river segments suitable for designation where such designation would contribute to the National Wild and Scenic Rivers System.

Protect outstandingly remarkable values identified on BLM-administered lands within the study corridors of eligible river segments studied and found suitable for inclusion as components of the National Wild and Scenic Rivers System.

Provide interim protective management for outstandingly remarkable values identified on BLM-administered lands along river segments determined eligible but not studied for inclusion as components of the National Wild and Scenic Rivers System.

Manage the natural integrity of river-related values to maintain or enhance the highest tentative classification determined for rivers found eligible or studied for suitability.

Land Use Allocations

There are no designated National Wild and Scenic River Segments on BLM-administered lands in the Coos Bay District, nor have any been found suitable for designation and inclusion into the national system.

The corridor width for rivers found eligible or studied for suitability is generally defined as 0.25 mile on either side of the river (approximately 0.5-mile wide corridor). Technically, these corridors are not land use allocations. None of the seven eligible rivers studied under the RMP process have been found suitable. However, if Congress passes legislation to designate them, they will be automatically added to the allocations of the resource management plan.

See Map 2-2 for segment locations of rivers within the planning area that are included in the national Wild and Scenic River System. Reports for river segments studied for inclusion in the national system are located in Appendix N of the draft RMP.

Management Actions/Direction

See Appendix I for general wild and scenic river management guidance.

Provide the following types of interim protection on river segments found eligible or suitable for inclusion as components of the National Wild and Scenic Rivers System:

Eligible and/or suitable recreational rivers: Exclude timber harvest in the riparian reserves, moderately restrict development of leasable and salable minerals, and protect a segment's free-flowing values and identified Outstandingly Remarkable Values.

Eligible and/or suitable scenic rivers: Exclude timber harvest in the riparian reserve, provide VRM Class II management in the 0.5-mile wide corridor, and protect a segment's free-flowing values and identified Outstandingly Remarkable Values.

Eligible and/or suitable wild rivers: Exclude timber harvest and other disturbing activities within the 0.5-mile wide corridor.

Upon completion of the ROD for this proposed resource management plan, release from interim protection all river segments found not suitable for inclusion as components of the national system.

Wilderness and Wilderness Study Areas

Objectives

Manage the use of resources within the designated Squaw Island Wilderness to preserve the undisturbed natural integrity of the area.

Maintain the wilderness character of the Zwagg Island and North Sisters Rocks Wilderness Study Area and the Cherry Creek Instant Study Area to comply with the Bureau's Wilderness Interim Management Policy.

Land Use Allocations

Area Name	Wilderness Status	Approximate Acreage
Squaw Island Wilderness	Designated	3
Zwagg Island and North Sisters Rock WSA	Study Area	8
Cherry Creek ISA	Study Area	570

See Map 2-2 for the location of these areas.

Management Actions/Direction

Follow interim management guidelines for wilderness study and instant study areas until decisions are made by Congress. Do not authorize action that would diminish the suitability of these lands as wilderness. Take appropriate actions following Congressional decision.

Revise the approved wilderness management plan for Squaw Island Wilderness to address attainment of Aquatic Conservation Strategy objectives and continue to implement the plan's management actions.

Rural Interface Areas

Objectives

Consider the interests of adjacent and nearby rural landowners—including residents—during analysis, planning, and monitoring related to managed rural interface areas. These interests include personal health and safety, improvements to property, and quality of life. Determine how landowners might be, or are, affected by activities on BLM-administered lands.

Land Use Allocations

Managed rural interface areas encompass approximately 2,100 acres of BLM-administered land within 0.25 mile of private lands zoned for 1- to 5-acre, or 5- to 20-acre, lots located throughout the district (see Map 2-6). None of these acres are included in the Matrix.

Management Actions/Direction

Work with local governments to:

- Improve the BLM data base regarding private land planning/zoning designations and residential development near BLM-administered land.
- Provide information to local planners regarding BLM land allocations in RIAs and the management objectives and guidelines for these lands.
- Develop design features and mitigation measures that will minimize the possibility of conflicts between private and federal land management.
- Monitor the effectiveness of design features and mitigation measures in RIAs.

As a part of watershed analysis and project planning, work with local individuals and groups—including fire protection districts—to identify and address concerns related to possible impacts of proposed management activities on rural interface areas.

Use design features and mitigation measures to avoid/minimize impacts to health, life, property, and quality of life. Examples include different harvest regimes, hand application rather than aerial application of herbicides and pesticides, and hand piling slash for burning as opposed to broadcast burning. Monitor the effectiveness of design features and mitigation measures.

Eliminate or mitigate public hazards such as abandoned mine tunnels and quarries.

Manage rural interface areas using visual resource management class III standards (unless an area is classified as visual resource management class I or II).

Reduce unauthorized public use of non-through or local roads within rural interface areas and within 0.25 mile of existing dwellings. Gates and other types of traffic barriers such as guardrails, berms, ditches, and log barricades will be used as appropriate. These actions are needed to reduce public health and safety hazards, fire risk, and vandalism to private property.

Encourage dust abatement measures when haulers use BLM roads under contracts, permits, and right-of-way agreements.

Reduce natural fuel hazards on BLM-administered lands in rural interface areas.

Socioeconomic Conditions

Objectives

Contribute to local, state, national and international economies through sustainable use of BLM-managed lands and resources and use of innovative contracting and other implementation strategies.

Provide amenities (e.g., recreation facilities, protected special areas, and high quality fisheries) that enhance communities as places to live and work.

Land Use Allocations

There are no specific land use allocations related to socioeconomic conditions. However, allocations such as the General Forest Management Area and adaptive management area can assist in meeting socioeconomic objectives.

Management Actions/Direction

Support and assist the State of Oregon Economic Development Department's efforts to help rural, resource-based communities develop and implement alternative economic strategies as a partial substitute for declining timber-based economies. Aid and support could include:

- Increased coordination with state and local governments and citizens to prioritize BLM management and development activities.
- Increased emphasis on management of special forest products.
- Recreation development and other activities identified by BLM and the involved communities as benefiting identified economic strategies.

Improve wildlife and fish habitat to enhance hunting and fishing opportunities and to increase the economic returns generated by these activities.

Improve viewing opportunities for watchable wildlife at the Dean Creek Elk Viewing Area, New River ACEC, and Coos Bay Shorelands.

Plan and design forest management activities to produce a sustained yield of products to support local and regional economic activity. A diversity of forest products (timber and non-timber) will be offered to support large and small commercial operations and provide for personal use.

Pursue opportunities for development of resource-based attractions at other specific locations such as the Coos Bay Shorelands, New River ACEC, Cape Blanco, and Cape Arago (Bal'diyaka) pending the completion of activity plans and available funding. These areas offer unique sets of resources that have broad appeal to the tourism-orientated visitors to the area and offer potential for diversification of the local economy.

Continue to participate as a member organization in Oregon Coastal Environments Awareness Network (OCEAN) to help foster educational and economic opportunities associated with the region's natural and cultural resource base.

Continue partnership efforts to plan, develop, and operate the proposed Bal'diyaka Cultural Heritage Interpretive Center.

Improve or develop numerous recreation sites, areas, trails, and Back Country Byways that can play a role in enhancing tourism activity within the district (see Recreation).

Recreation

Objectives

Provide a wide range of developed and dispersed recreation opportunities that contribute to meeting projected recreation demand within the planning area.

Manage scenic, natural, and cultural resources to enhance visitor recreation experience expectations and produce satisfied public land users.

Support locally-sponsored tourism initiatives and community economic strategies by providing recreation projects and programs that benefit both short- and long-term implementation.

Manage off-highway vehicle use on BLM-administered land to protect natural resources, provide visitor safety, and minimize conflicts among various users.

Enhance recreation opportunities provided by existing and proposed Watchable Wildlife areas and National Back Country Byways.

Continue to provide nonmotorized recreation opportunities and create additional opportunities where consistent with other management objectives.

Manage special and extensive recreation management areas in a manner consistent with BLM's Recreation 2000 Implementation Plan and Oregon-Washington Public Lands Recreation initiative.

Land Use Allocations

Allocations by Recreation Management Category are displayed in Table 2-5.

See Map 2-7 for locations and Table 2-6 for a list of recreation sites and areas for the PRMP.

Management Actions/Direction

Riparian Reserves

Design and construct new recreational facilities within Riparian Reserves—including trails and dispersed sites—in a manner that does not interfere with meeting Aquatic Conservation Strategy objectives. Construction of these facilities should not prevent future attainment of these objectives. For existing recreation facilities within Riparian Reserves, evaluate and mitigate impacts to ensure that these do not prevent, and to the extent practicable contribute to, attainment of Aquatic Conservation Strategy objectives.

Adjust dispersed and developed recreation practices that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where adjustment measures such as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, and/or specific site closures are not effective, eliminate the practice or occupancy.

Management Actions/Direction

Late-Successional Reserves

Retain and maintain existing recreation developments consistent with other management actions/direction for Late-Successional Reserves.

Use adjustment measures—such as education, use limitations, traffic control devices, or increased maintenance—when dispersed or developed

Table 2-5. Land Use Allocations by Recreation Management Category

Recreation Management Category	Number	Acres	Miles
Recreation Sites			
Existing	11	1,655	
Proposed	12	410	
Recreation Trails			
Existing	4		4
Proposed	8		38-52
Special Recreation Management Areas [1]			
Existing	4	3,700	
Proposed	3	25,700	
Off-Highway Vehicle Use Areas			
Open		80	
Limited		326,600	
Closed		3,000	
Back Country Byways			
Existing	0		0
Proposed	5		155

[1] Does not include potential acquisitions to expand existing or proposed SRMAs.

Table 2-6. Existing and Proposed Recreation Sites, Areas, Trails, and Back Country Byways Under the PRMP

RECREATION SITES

Existing	Proposed
Loon Lake[1]	Big Bend
East Shore Loon Lake[1]	Smith River Log Dump
Smith River Falls	Smith River Falls Boat Ramp
Vincent Creek	Fawn Creek Boat Ramp
Laverne Park[2]	Vincent Creek Boat Ramp
Big Tree	Umpqua Lighthouse
Park Creek	North Spit Public Fishing Dock[6]
Burnt Mountain Cabin	McKinley Camp
North Spit Boat Ramp[3]	Tioga Basin
Frona Park[2]	East Fairview Boat Ramp
Bear Creek	Rock Prairie Park[2]
Sixes River[4]	Rock Prairie Boat Ramp
Palmer Butte	Middle Creek Park[2]
	Judge Hamilton Park[2]
	Cape Blanco
	South Sisters Rock

SPECIAL RECREATION MANAGEMENT AREAS

Existing	Proposed
Loon Lake/East Shore[5]	Tioga
Dean Creek Elk Viewing Area[5]	Gregory Point (Bal'diyaka)
Coos Bay Shorelands[5]	Sixes River
New River[5]	

TRAILS

Existing	Proposed
Loon Lake Waterfall	Roman Nose/Kentucky Creek
Big Tree	Wassen Creek
Brummit Fir (Doerner Fir)	McKinley Camp
New River	Upper Rock Creek
	Camp Myrtlewood
	North Fork Hunter Creek
	Hunter Creek Bog
	Palmer Butte

BACK COUNTRY BYWAYS

Existing	Proposed
None	Smith River Road
	South Sisters-Oxbow Access Road
	Mill Creek/Loon Lake/Tyee
	Coos Bay Wagon Road
	Myrtle Point to Sitkum Road

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[1] These two sites comprise the Loon Lake/East Shore SRMA.

[2] Existing or Proposed Coos County Parks; not included in Table 2-1.

[3] Site is within the Coos Bay Shorelands SRMA.

[4] This site is part of the proposed Sixes River SRMA.

[5] SRMA includes proposed acquisitions through exchange or easements.

[6] Proposed additional facility at the existing North Spit Boat Ramp site.

recreation practices retard or prevent attainment of Late-Successional Reserve objectives.

Neither construct nor authorize new facilities that may adversely affect Late-Successional Reserves.

Review on a case-by-case basis new recreation development proposals. They may be approved when adverse effects can be minimized and mitigated.

Locate new recreation developments to avoid degradation of habitat and adverse effects on identified late-successional species.

Remove hazard trees along trails and in developed recreation areas.

Management Actions/Direction

All Land Use Allocations

In addition to the guidelines for late-successional and riparian reserves, manage recreation resources in accordance with the following guidelines:

Recreation Sites and Trails

Continue to operate and maintain 11 developed recreation sites and 4 developed trails (see Table 2-6).

Designate developed recreation sites as fire suppression areas (intensive) and fire fuels management areas. These designations will reduce fire hazards and protect investments. Restrictions on fire suppression equipment and activities will be required in the Loon Lake, East Shore Loon Lake, Smith River Falls, Big Tree, Park Creek, Bear Creek, and Sixes River recreation areas or sites. Specific equipment restrictions will be identified in management plans for these sites and areas.

Manage timber within developed or proposed recreation sites/areas for purposes of removing hazard trees, providing space for additional facilities and activity areas, and providing desired regeneration of the forest canopy.

Maintain potential for recreation development in 13 sites, including 5 boat ramps and the North Spit public fishing dock, and 8 trail locations (see Table 2-6). Develop potential sites and trails as funding becomes available.

Pursue mineral withdrawals for existing developed recreation sites and for proposed recreation sites when development is approved.

Special Recreation Management Areas

Continue to manage 4 existing SRMAs, designate 2 new SRMAs (Sixes River and Tioga), and maintain potential to develop one new SRMA (Gregory Point). Expand the 4 existing SRMAs (see Table 2-6) through planned land acquisitions (exchanges, fee purchase, or easement acquisitions). Address special recreation management area (SRMA) issues and prioritize projects in watershed analyses. Manage Dean Creek SRMA according to the existing management plan for the Elk Viewing area. Prepare a management plan for the Loon Lake Sixes River and Tioga SRMAs, complete ongoing management plans for the New River and Coos Bay Shorelands SRMAs, and prepare project plans as needed.

Extensive Recreation Management Areas

Address extensive recreation management area issues and prioritize projects in watershed analyses. Prepare project plans as needed.

Back Country Byways

Designate and facilitate use of up to 5 new Back Country Byways (see Table 2-6). Install signing and develop interpretive brochures an waysides to facilitate use.

Coordinate planning, designation, and management of Back Country Byways with county governments, chambers of commerce, regional tourism alliances, adjacent landowners, and the U. S. Forest Service.

Off-Highway Vehicles

Designate the majority of BLM-administered land open to off-highway vehicle use on designated roads and trails (see Appendix J).

Close or continue to manage as "closed" the following sites/areas to off-highway vehicle use (approximately 3,000 acres):

- Wilderness Areas
- Wilderness Study Areas
- Cherry Creek Research Natural Areas
- Progeny Test Sites/Seed Orchards

- Big Tree Recreation Site
- Tioga Creek ACEC
- China Wall ACEC
- Powers Environmental Education Area
- Most BLM-administered lands in the New River ACEC
- Fenced Snowy plover areas on the North Spit of Coos Bay
- Dean Creek Elk Viewing Area, except for the developed parking and access roads

Limit off-highway vehicle use to designated roads throughout most of the District including the following sites/areas (approximately 326,600 acres):

- Developed and proposed recreation sites/ areas.
- Late-Successional Reserves.
- Riparian Reserves.
- Proposed ACECs (Wassen Creek, North Spit, North Fork Coquille River, Upper Rock Creek, North Fork Hunter Creek, Hunter Creek Bog, and North Fork Chetco River).
- Close and rehabilitate roads that are not needed for continued resource management or use. Within the ODFW Tioga Big Game Management Area (approximately 190,200 acres), the goal will be to maintain 1.1 miles of road per section per watershed with a maximum density of 2.9 miles per section per watershed when all classes of road are considered. In the remainder of the district, the goal will be to maintain a density of 2.9 miles of road per section per watershed. Roads to be closed or with restricted access would be primarily local roads, and secondary or collector roads.

Manage the 80-acre Umpqua Lighthouse site as open to unrestricted access by OHVs.

Where compatible with other resource management objectives, closed roads would be available to the public for non-motorized access for recreational pursuits including hiking, horseback riding, mountain biking, and walk-in hunting. Similarly, closed roads would be available for linking by trails to provide a network of non-motorized recreation opportunities.

Prepare an implementation plan for off-highway vehicle use designations.

General

Enhance travel and recreation management through increased emphasis on interpretive and informational signs and maps. Identify on informational handouts at field locations all major travel routes within the planning area. Prepare a district-wide travel map for public distribution. These actions would support state and local strategies to encourage tourism.

In addition to the existing and potential recreation sites, areas, and trails under the PRMP, the district would consider additional sites and areas for recreational use and development as warranted by increased recreation needs and demands, opportunities to enhance local economic vitality, or where new recreation opportunities arise. Additional land acquisitions to enhance recreation resource opportunities would be identified and evaluated on a case-by-case basis through watershed analysis and activity-level planning.

Where appropriate and compatible with other resource management objectives, BLM would work with the private sector and not-for-profit organizations to develop suitable sites and provide recreation facilities, management, and services on BLM-administered lands. Recreation lease opportunities or proposals would be considered on a case-by-case basis to provide for or enhance recreational use and enjoyment of public lands, and/ or stimulate investment and economic diversity in the planning area.

Manage recreation areas to minimize disturbance to a number of fungus and lichen species known to occur within these areas. Follow survey and manage actions/direction as stated in the introduction to Land Use Allocations and Resource Programs.

Timber Resources

Objectives

Provide a sustainable supply of timber and other forest products.

Manage developing stands on available lands to promote tree survival and growth and to achieve a balance between wood volume production, quality of wood, and timber value at harvest.

Manage timber stands to reduce the risk of stand loss from fires, animals, insects, and diseases.

Provide for salvage harvest of timber killed or damaged by events such as wildfire, windstorms, insects, or disease, consistent with management objectives for other resources.

Land Use Allocations

Lands available for scheduled timber harvest are as follows:

Land Use Allocation	Approximate Acres
General Forest Management Areas (including visual resource management class II, rural interface, and TPCC restricted)	55,300
Connectivity/Diversity Blocks	6,600

Management Actions/Direction

All Land Use Allocations

Conform all management activities within the range of Port-Orford-cedar to the guidelines described in the *BLM Port-Orford-cedar Management Policies* to mitigate damage caused by *Phytophthora lateralis*. Site-specific analysis for projects within the range of Port-Orford-cedar will consider possible effects on the species.

Management Actions/Direction

Matrix (General Forest Management Area and Connectivity/Diversity Blocks)

Determine the probable level of harvest based on the productivity of lands available for timber production and on the silvicultural treatments planned for these lands.

Maintain a well-distributed pattern of early and mid-seral forest across the Matrix.

Apply silvicultural systems that are planned to produce, over time, forests with desired species composition, structural characteristics, and distribution of seral or age classes (see Appendix K).

Develop plans for the locations and specific designs of timber harvests and other silvicultural treatments within the framework of watershed analyses (see Appendix F).

Select logging systems based on the suitability and economic efficiency of each system for the successful implementation of the silvicultural prescription, for protection of soil and water quality, and for meeting other land use objectives.

Schedule regeneration harvests to assure that, over time, harvest occurs in stands at or above the age of volume growth culmination (i.e., culmination of mean annual increment). This refers to the age range which produces maximum average annual growth over the lifetime of a timber stand. In the planning area, culmination occurs between 60 and 80 years of age. To develop a desired age class distribution across the landscape, regeneration harvests will be scheduled in stands as young as 60 years.

Base silvicultural treatments and harvest designs on the functional characteristics of the ecosystem and on the characteristics of each forest stand and site. Treatments would be designed—as much as possible—to prevent the development of undesirable species composition, species dominance, or other stand characteristics. The principles of integrated pest management and integrated vegetation management would be employed to avoid the need for direct treatments. Herbicides would be used only as a last resort.

Plan harvest of marketable hardwood stands in the same manner as conifer stands, unless the land is otherwise constrained from timber management. Volume from projected hardwood harvest would be in addition to the probable sale quantity estimate. Where hardwood stands became established following previous harvest of conifers, plan to re-establish a conifer stand on the site.

For unscheduled harvests, see the Riparian Reserves and Late-Successional Reserves sections.

Minimize disturbance of identified fragile sites (Nonsuitable Woodlands and Suitable Woodlands. See Figure 2-1).

Management Actions/Direction

General Forest Management Area

Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management action/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forest lands are currently comprised of

15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands. Protection of these stands could be modified in the future when other portions of a watershed have recovered to the point where they could replace the ecological roles of these stands.

Retain snags within a timber harvest unit at levels sufficient to support species of cavity-nesting birds at 40 percent of potential population levels. Meet the 40 percent minimum throughout the Matrix with per acre requirements met on average areas no larger than 40 acres.

Retain 6-8 green conifer trees per acre after regeneration harvest to provide a source of snag recruitment and a legacy for bridging past and future forests. Retained trees will be distributed in variable patterns (e.g., single trees, clumps and stringers) to contribute to stand diversity.

In addition to the green tree retention management action/direction, retain green trees for snag recruitment in harvest units where there is an identified, near-term (less than three decades) snag deficit. These trees do not count toward green-tree retention requirements.

Leave 120 linear feet of logs per acre greater than or equal to 16 inches in diameter and 16 feet long. Existing decay class 1 and 2 logs count toward this requirement. Down logs will reflect the species mix of original stands. Where this management action/direction cannot be met with existing coarse woody debris, merchantable material will be used to make up the deficit.

Management Actions/Direction

Connectivity/Diversity Blocks

Maintain 25 to 30 percent of each block in late-successional forest at any point in time. The percentage of habitat will include habitat in other allocations such as Riparian Reserves. Blocks may be comprised of contiguous or noncontiguous BLM-administered land. The size and arrangement of habitat within a block should provide effective habitat to the extent possible.

Retain 12-18 green conifer trees per acre when an area is regeneration harvested. Distribute the retained trees in variable patterns (e.g., single trees, clumps and stringers) to contribute to stand diversity. The management goal for the retained trees and subsequent density management would be the recovery of old-growth conditions in approximately 100 to 120 years.

Leave 120 linear feet of logs per acre greater than or equal to 16 inches in diameter and 16 feet long. Existing decay class 1 and 2 logs will be credited toward this total. Down logs will reflect the species mix of original stands. Where this management action/direction cannot be met with existing coarse woody debris, merchantable material will be used to make up the deficit.

Special Forest Products

Objectives

Manage for the production and sale of special forest products (SFPs) when demand is present and where actions taken are consistent with primary objectives for the land use allocation.

Use the principles of ecosystem management to guide the management and harvest of special forest products.

Land Use Allocations

No land use allocations are made specifically for special forest products.

Management Actions/Direction

Riparian Reserves

Where catastrophic events result in degraded riparian conditions, allow fuelwood cutting if required to attain Aquatic Conservation Strategy objectives.

Management Actions/Direction

Late-Successional Reserves

Permit fuelwood gathering only in existing cull decks, in areas where green trees are marked by silviculturists for thinning, in areas where blowdown is blocking roads, and in recently harvested timber sale units where down material will impede scheduled post-sale activities or pose an unacceptable risk of future large scale disturbance. In all cases, these activities will comply with management actions/direction for Late-Successional Reserves.

Evaluate whether special forest product harvest activities have adverse effects on Late-Successional Reserve objectives.

Prior to selling special forest products, ensure resource sustainability and protection of other resource values such as special status plants or animal species.

Where special forest product activities are extensive, evaluate whether they have significant effects on late-successional habitat. Restrictions may be appropriate in some cases.

Management Actions/Direction

All Land Use Allocations

Allow harvest of Special Forest Products throughout the district, but apply the area restrictions as shown in Table 2-7 and the plant species or group restrictions as shown in Table 2-8.

Establish specific guidelines for the management of individual Special Forest Products using interdisciplinary review as needed. Management guidelines would be based on the ecological characteristics of the SFP species and the requirements of associated plant, animal, and fungal species. Guidelines will include provisions that minimize changes in site productivity. Monitoring of harvest activities and the effects of harvest would be part of SFP management. Feasibility to harvest newly identified SFP species would receive interdisciplinary review.

Provide opportunities for firewood cutting along roadsides where trees are obstructing sight distance, are a safety hazard, or are creating road maintenance problems.

In appropriate areas (e.g., the Matrix), manage hardwood stands originating from nonhuman causes for the continued production and sale of hardwood timber and products.

Energy and Minerals

Objectives

Maintain exploration and development opportunities for leasable and locatable energy and mineral resources.

Provide opportunities for extraction of salable minerals by other government entities, private industry, individuals, and nonprofit organizations.

Continue to make mineral resources available on the reserved federal mineral estate.

Land Use Allocations

The amount of BLM-administered lands with a potential for occurrence of energy and mineral resources and available for exploration and development is as follows:

Mineral Resource	Approximate Acres
Leasable	328,000
Locatable	317,000
Salable	314,300

There are approximately 1,250 acres of private land with reserved federal mineral estate (also referred to as federal subsurface mineral estate).

Management Actions/Direction

See Tables 2-9, 2-10, and 2-11 and Maps 2-8 and 2-9 for restrictions on energy and mineral activities. See Appendix M for leasing stipulations and operating standards pertinent to locatable and salable minerals.

Riparian Reserves

Note: The following management actions/direction differ from the standards and guidelines in the SEIS ROD, since the standards and guidelines are not all implementable under current laws and regulations. The stronger standards and guidelines in the SEIS ROD (see Appendix F) will be adopted at such time as changes in current laws and/or regulations authorize their implementation.

For any proposed locatable mining operation in Riparian Reserves— other than notice level or casual use—require the following actions by the operator consistent with 43 CFR 3809:

- Prepare a Plan of Operations, including a reclamation plan and reclamation bond for all mining operations in Riparian Reserves. Such plans and bonds will address the costs of removing facilities, equipment, and materials; recontouring of disturbed areas to an approved topography; isolating and neutralizing or removing toxic or potentially toxic materials; salvaging and replacing topsoil; and revegetating to meet Aquatic Conservation Strategy objectives.
- Locate structures, support facilities, and roads outside Riparian Reserves. If no alternative to siting facilities in Riparian

Table 2-7. Area Restrictions for Special Forest Products

Area	Limited Harvest	No Harvest
Areas of Critical Environmental Concern	X	
Research Natural Areas		X
Environmental education areas	X	
Special habitats	X	
Developed recreation sites	X	
Known cultural resource sites	X	
Wetlands	X	
Fragile soils areas	X	
Special status fauna or flora sites		X
Connectivity/Diversity Blocks	X	
Late Successional Reserves	X	
Riparian Reserves	X	
Key Watersheds	X	
Progeny Test Sites/Seed Orchards	X	

Table 2-8. Plant Species or Groups Restrictions for Special Forest Products

Plant Species or Group	Limited Harvest	No Harvest
Lily family (*Liliaceae*) except beargrass	X	
Orchid family (*Orchidaceae*)		X
Iris family (*Iridaceae*) except common iris	X	
Special status plant species		X
Truffles	X	
Mushrooms	X	
Lichens	X	
Mosses	X	
Ferns	X	
Conifer boughs	X	
Conifer wildings	X	
Port-Orford-Cedar boughs	X	
Hardwood brush boughs	X	
Hardwood wildings	X	

Table 2-9. Oil and Gas and Geothermal Lease Restrictions

Restriction		Acres
Closed -	Nondiscretionary [1]	1,600
Open -	No Surface Occupancy [2]	170,300
Open -	With Standard Lease Terms	101,400
Open -	With Additional Restrictions [3]	56,300

[1] Congressionally designated areas, other agency withdrawals, Wilderness, and Wilderness Study Areas.

[2] Recreation sites and areas, R&PP and FLPMA leases, Special Areas, VRM Class I areas, Riparian Reserves, progeny test sites, regional forest nutritional study areas, threatened and endangered species habitat, great blue heron rookeries, and osprey nest sites.

[3] Special Recreation Management Areas, Suitable and Eligible (but not assessed) Recreational Rivers, Powersite Withdrawals, VRM Class II lands, fragile slopes, Federal Mineral Estate Only, Late-Successional Reserves, Special Status Species habitat, managed Rural Interface Areas, and seasonal wildlife restrictions.

Table 2-10. Locatable Mineral Restrictions

Restriction		Acres
Closed -	Nondiscretionary [1]	1,000
Closed -	Discretionary [2]	11,500
Open -	Standard Requirements	99,500
Open -	With Additional Restrictions [3]	217,600

[1] Congressionally designated areas and acquired lands.

[2] R&PP and FLPMA classifications or leases, Special Areas, Recreation Areas and Sites, Cherry Creek RNA, and BLM maintenance sites.

[3] Late-Successional Reserves, Riparian Reserves, powersite reserves, progeny test sites, areas closed to OHV, special areas, T&E plant and animal critical habitats, Regional Forest nutritional study installations, VRM class I and II, suitable and eligible (but not assessed) recreational river segments, seasonal wildlife restrictions, federal mineral estate only, and powersite classifications (placer operations only).

Table 2-11. Salable Mineral Restrictions

Restriction		Acres
Closed -	Nondiscretionary [1]	600
Closed -	Discretionary [2]	14,700
Open -	Standard Requirements	84,600
Open -	With Additional Restrictions [3]	229,700

[1] Congressionally designated areas.

[2] BLM maintenance sites, progeny test sites, Regional Forest nutritional study installations, R&PP and FLPMA leases, recreation areas and sites, VRM Class I lands, special areas, great blue heron rookeries, osprey nest sites, pending withdrawals, and proposed exchanges.

[3] Late-Successional Reserves, Riparian Reserves, federal mineral estate only, special recreation management areas, VRM Class II lands, critical habitat for threatened and endangered species, special status species habitat, and suitable and eligible (but not assessed) recreational rivers.

Reserves exists, locate in a way compatible with Aquatic Conservation Strategy objectives. Road construction will be kept to the minimum necessary for the approved mineral activity. Roads will be constructed and maintained to meet road management standards and to minimize damage to resources in Riparian Reserves. When a road is no longer required for mineral or land management activities, it will be reclaimed. In any case, access roads will be constructed consistent with 43 CFR 3809 and acceptable road construction standards and will minimize damage to resources in Riparian Reserves.

- Avoid locating solid and sanitary waste facilities in Riparian Reserves. If there is no alternative to locating mine waste (waste rock, spent ore, and tailings) facilities in Riparian Reserves—and if releases can be prevented and stability can be ensured—then:

- Analyze the waste material using the best conventional sampling methods and analytic techniques to determine its chemical and physical stability characteristics.

- Locate and design the waste facilities using best conventional techniques to ensure mass stability and prevent the release of acid or toxic materials. If the best conventional technology is not sufficient to prevent such releases and ensure stability over the long term, prohibit such facilities in Riparian Reserves.

- Reclaim waste facilities after operations to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives.

- Monitor waste and waste facilities after operations to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives.

- Require reclamation bonds adequate to ensure chemical and physical stability and to meet Aquatic Conservation Strategy objectives.

- Where an existing operator is in noncompliance at the notice level (i.e., causing unnecessary or undue degradation), require actions similar to those stated above to meet the intent of 43 CFR 3809.

For leasable minerals, prohibit surface occupancy for oil, gas, and geothermal exploration and development activities where leases do not exist. Where possible, adjust the stipulations in existing leases to eliminate impacts that retard or prevent the attainment of Aquatic Conservation Strategy objectives consistent with existing lease terms and stipulations.

Allow development of salable minerals (such as sand and gravel) within Riparian Reserves only if Aquatic Conservation Strategy objectives can be met.

Develop inspection and monitoring requirements and include such requirements in exploration and mining plans and in leases or permits consistent with existing laws and regulations. Evaluate the results of inspection and monitoring to determine if modification of plans, leases, and permits is needed to eliminate impacts that retard or prevent attainment of Aquatic Conservation Strategy objectives.

Management Actions/Direction

Late-Successional Reserves

Assess the impacts of ongoing and proposed mining activities in Late-Successional Reserves.

Include stipulations in mineral leases and, when legally possible, require operational constraints for locatable mineral activities to minimize detrimental effects on late-successional habitat.

Management Actions/Direction

All Land Use Allocations

Leasable Minerals

Use special stipulations for oil, gas, and geothermal leases to protect fragile areas or critical resource values (see Appendix M for a list of mineral restrictions by resource value). Special stipulations may include:

- Seasonal restrictions to protect resources such as critical wildlife habitat and to prevent excessive erosion.

- Controlled surface use stipulations to protect valuable resources in small areas.

- No surface occupancy stipulations to protect valuable resources scattered over a large area while still providing an opportunity for exploration and development.

Special stipulations may be waived by authorized BLM officials if the objective of a stipulation could be met in another way.

Provide opportunities for coal and geothermal exploration and development in areas with potential for occurrence. Coal activities are regulated under 43 CFR 3400, and geothermal activities are regulated under 43 CFR 3200.

Locatable Minerals

Use general requirements in 43 CFR 3809 and site-specific guidelines to avoid unnecessary or undue degradation of resources on mining claims.

Require reclamation at the earliest feasible time for all surface-disturbing operations, whether conducted under a notice or approved plan of operations.

Allow activities exceeding casual use, but disturbing five acres or less, to proceed 15 days after a notice is filed with the Coos Bay BLM District.

Require an approved plan of operation before work can begin on projects disturbing more than five acres or special resource areas.

Require bonding of plans of operations to ensure mitigation measures are followed and reclamation of the disturbed lands is completed.

Salable Minerals

Address quarry development, management, and reclamation needs through implementation planning.

Emphasize long-term regional quarry use.

Develop new quarry sites in locations consistent with overall management objectives and guidelines of the proposed resource management plan.

Continue to use rock from existing quarries for construction and maintenance of timber sale access roads and other purposes.

Make salable minerals available for other government agencies if requested, and if the action is consistent with management direction for protection of other resources.

Issue sales for mineral materials that provide for reclamation of mined lands pursuant to 43 CFR 3604 or 3610 regulations.

Consider mineral materials permits on a case-by-case basis. Issue them at the discretion of the Area Manager.

Reserved Federal Mineral Estate

Allow the reserved federal mineral estate to remain open for mineral development.

Allow development of locatable and salable minerals in accordance with restrictions determined by the surface owner/administrator.

Convey mineral interests owned by the United States where the surface is, or will be, in nonfederal ownership, to the existing or proposed owner of the surface estate only after a determination is made under Section 209(b) of FLPMA.

Range Resources

Objectives

Provide for livestock grazing in an environmentally sensitive manner consistent with other objectives and land use allocations.

Provide for rangeland improvement projects and management practices consistent with other objectives and land use allocations.

Land Use Allocations

Where livestock grazing is authorized through a grazing lease, the area of use is defined by the grazing lease.

Management Actions/Direction

Riparian Reserves

Through a planning and environmental analysis process appropriate to the action, adjust or eliminate grazing practices that retard or prevent attainment of Aquatic Conservation Strategy objectives.

Locate new livestock handling and/or management facilities outside Riparian Reserves. For existing livestock handling facilities inside Riparian Reserves, ensure that Aquatic Conservation Strategy objectives are met. Where these objectives cannot be met, require relocation or removal of such facilities.

Limit livestock trailing, bedding, watering, loading, and other handling efforts to those areas and times that will ensure Aquatic Conservation Strategy objectives are met.

Management Actions/Direction

Late-Successional Reserves

In coordination with wildlife and fish biologists, implement range-related management activities that do not adversely affect late-successional habitat.

Through a planning and environmental analysis process appropriate to the action, adjust or eliminate grazing practices that retard or prevent attainment of Late-Successional Reserve objectives.

Evaluate effects of existing and proposed livestock management and handling facilities in Late-Successional Reserves to determine if reserve objectives are met. Where objectives cannot be met, relocate livestock management and/or handling facilities.

Management Actions/Direction

All Land Use Allocations

Apply the management actions/direction in the Special Status and SEIS Special Attention Species section.

Land Tenure Adjustments

Objectives

Make land tenure adjustments to benefit a variety of uses and values. Emphasize opportunities that conserve biological diversity or enhance timber management opportunities. As a matter of practice, O&C forest lands allocated to timber management would only be exchanged for lands to be managed for multiple-use purposes.

Meet the following objectives for the three land tenure adjustment zones:

- **Zone 1:** Generally, retain these lands under BLM administration.
- **Zone 2:** "Block up" areas in Zone 2 with significant resource values and exchange other lands in Zone 2 to "block up" areas in Zones 1 and 2 with significant resource values.
- **Zone 3:** Retain lands with unique resource values; dispose of other lands in this zone using appropriate disposal mechanisms.

Make BLM-administered lands in Zones 1, 2, and 3 available for a variety of uses as authorized by section 302 of the Federal Land Policy and Management Act, the Recreation and Public Purposes Act, and special recreation permits.

Manage newly-acquired lands for the purpose for which they are acquired or consistent with the management objectives for adjacent BLM-administered lands. If lands with unique or fragile resource values are acquired, protect those values until the next plan revision.

Eliminate unauthorized use of BLM-administered land.

Land Use Allocations

Zone	Approximate Acres
Zone 1	4,600
Zone 2	324,000
Zone 3	1,100

See Map 2-10 for location of land tenure zones. See Appendix N for legal descriptions of Zone 3 lands.

Management Actions/Direction

Riparian Reserves

Use land acquisition, exchange, and conservation easements to meet Aquatic Conservation Strategy objectives and facilitate restoration of fish stocks and other species at risk of extinction.

Management Actions/Direction

Late-Successional Reserves

Consider land exchanges when they will provide benefits equal to or better than current conditions.

Consider land exchanges especially to improve area, distribution, and quality (e.g., connectivity, shape, and contribution to biodiversity) of Late-Successional Reserves and where public and private lands are intermingled.

Management Actions/Direction

All Land Use Allocations

Use the land tenure adjustment criteria shown in Appendix O when conducting environmental analyses for site-specific proposals. Application of these criteria may result in retention of some Zone 3 lands.

Maintain or increase public land holdings in Zone 1 by retaining public lands and acquiring nonfederal lands with high public resource values. The primary mode of acquisition will be through exchange of BLM-administered lands in Zones 2 and 3. Utilize purchases and donations if exchange is not feasible. All fee acquisitions will be with willing sellers.

Consult with county governments prior to any exchange or sale involving O&C or CBWR lands.

Consider the effect of land tenure adjustments on the mineral estate. If the lands are not known to have mineral potential, or in an exchange if the mineral potential is deemed equal, the mineral estate will normally be transferred simultaneously with the surface estate.

Minimize impact on local tax base by emphasizing exchanges rather than fee purchase.

Make exchanges to enhance public resource values and/or improve land patterns and management capabilities of both private and BLM-administered land within the planning area by consolidating ownership and reducing the potential for land use conflict.

Consider transfer of BLM-administered land to other federal agencies or acquisition of other federal lands where consistent with public land management policy and where improved management efficiency would result.

Consider conveying the subsurface mineral interest owned by the United States to the existing or proposed owner of the surface estate consistent with FLPMA Section 209(b).

Prohibit disposal of Zone 2 lands through sales under Section 203(a) of FLPMA. Zone 2 lands may be transferred to other public agencies or managed under some form of cooperative agreement.

Dispose of Zone 3 lands through sale under Section 203(a) of FLPMA if no viable exchange proposals can be identified. Zone 3 lands could also be transferred to another federal agency or state or local government, as needed, to accommodate community expansion or other public purposes.

Realign the Coos Bay/Medford District boundaries and sustained yield unit boundaries to administratively transfer jurisdiction of the land in the O'Brien-Takilma area from the Coos Bay District to the Medford District.

Realign the Coos Bay/Roseburg District boundaries and sustained yield unit boundaries to administratively transfer jurisdiction of the BLM-administered land in T. 271/2 S., R. 8 W., W.M., from the Coos Bay District to the Roseburg District.

Exchange of O&C and CBWR lands would be made primarily to acquire lands that would enhance timber management opportunities. Exchanges of Public Domain lands would be made to benefit one or more of the resources managed, including nontimber values. Sale of O&C and CBWR lands other than available commercial forest lands and Public Domain lands would be made to dispose of lands that meet the criteria of FLPMA Section 203 (a).

BLM-administered lands on the North Spit of Coos Bay within Coos County Comprehensive Plan zoning districts 3E-WD, 4CS, and 6WD could be offered for exchange, sale, or lease to accommodate local economic expansion and industrial development. BLM could acquire lands in zoning district 2CS to benefit recreation and wildlife, in zoning district 5A-NS to benefit wildlife values, or other lands to benefit other resource values.

Rights-of-Way

Objectives

Continue to make BLM-administered lands available for needed rights-of-way where consistent with local comprehensive plans, Oregon statewide planning goals and rules, and the exclusion and avoidance areas identified in this PRMP.

Ensure that all rights-of-way for hydroelectric development are consistent with the Northwest Power Planning Council guidance, which recommends prohibiting future hydroelectric development on certain rivers and streams with significant fisheries and wildlife values.

Land Use Allocations

Allocation of lands to existing rights-of-way would continue.

Rights-of-Way	Miles	Number
High voltage transmission lines	16	
Communication sites		9

Locations are shown on Map 2-11.

The Western Regional Corridor Study did not identify any potential new rights-of-way within the district.

Subject to valid existing rights and with the exception of buried lines in rights-of-way of existing roads, exclude rights-of way in the following areas:

Exclusion Area	Approximate Acres
Research Natural Areas	570
Wilderness Study Areas	8
Wilderness Areas	8
VRM Class I Areas	0

VRM Class I areas are included in the above acreages.

With the exception of buried lines in rights-of-way of existing roads, avoid locating rights-of-way in the following areas:

Avoidance Area	Approximate Acres
Recreation Sites (existing and proposed)	2,700
Areas of Critical Environmental Concern (except Research Natural Areas)	1,400
Scenic and Recreational Rivers (suitable, designated)	0
Sensitive Species Habitat	100
VRM Class II Areas	0
Late-Successional Reserves	142,500

Future rights-of-way may be granted in avoidance areas when no feasible alternative route or designated right-of-way corridor is available.

Management Actions/Direction

Riparian Reserves

Issue rights-of-way to avoid adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives. Where legally possible, adjust existing rights-of-way to eliminate adverse effects that retard or prevent the attainment of Aquatic Conservation Strategy objectives. If adjustments are not effective and where legally possible, eliminate the activity. Priority for modifying existing rights-of-way will be based on the actual or potential impact and the ecological value of the riparian resources affected.

For proposed hydroelectric projects under the jurisdiction of the Federal Energy Regulatory Commission (the Commission), provide timely, written comments regarding maintenance of instream flows and habitat conditions and maintenance/restoration of riparian resources and stream channel integrity. Request the Commission to locate proposed support facilities outside of Riparian Reserves. For existing support facilities inside Riparian Reserves that are essential to proper management, provide recommendations to the Commission that ensure Aquatic Conservation Strategy objectives are met. Where these objectives cannot be met, provide recommendations to the Commission that such support facilities should be relocated. Existing support facilities that must be located in the Riparian Reserves should be located, operated, and maintained with an emphasis to eliminate adverse effects that retard or prevent attainment of Aquatic Conservation Strategy objectives.

For other hydroelectric and surface water development proposals in Tier One Key Watersheds, require instream flows and habitat conditions that maintain or restore riparian resources, favorable channel conditions, and fish passage. Coordinate this process with the appropriate state agencies. For other hydroelectric and surface water development proposals in all other watersheds, give priority emphasis to instream flows and habitat conditions that maintain or restore riparian resources, favorable channel conditions, and fish passage. Coordinate this process with the appropriate state agencies.

Management Actions/Direction

Late-Successional Reserves

Retain and maintain existing developments (such as utility corridors and electronic sites) consistent with other management actions/direction for Late-Successional Reserves.

Neither construct nor authorize new facilities that may adversely affect Late-Successional Reserves.

Review on a case-by-case basis new development proposals. They may be approved when adverse effects can be minimized and mitigated.

Locate new developments to avoid degradation of habitat and adverse effects on identified late-successional species.

Remove hazard trees along utility rights-of-way and in other developed areas.

Management Actions/Direction

Other Land Use Allocations

Encourage location of major new rights-of-way projects in existing utility/transportation routes and other previously designated corridors.

Encourage applicants to consult the Western Regional Corridor Study in planning route locations.

Consider new locations for rights-of-way projects on a case-by-case basis. Applications may be approved where the applicant can demonstrate that use of an existing route or corridor would not be technically or economically feasible; and the proposed project would otherwise be consistent with this proposed resource management plan and would minimize damage to the environment.

Allow expansion of communications facilities on existing communication sites.

Consider new communication sites on a case-by-case basis. Applications may be approved where the applicant can demonstrate that use of an existing, developed communication site would not be technically feasible; and the proposed facility would otherwise be consistent with this proposed resource management plan and would minimize damage to the environment.

Access

Objectives

Acquire access to public lands that assist various programs to meet management objectives.

Land Use Allocations

None

Management Actions/Direction

Acquire access by obtaining easements, entering into new reciprocal right-of-way agreements, or amending existing reciprocal right-of-way agreements. Condemnation for access will be pursued when necessary.

Acquire perpetual exclusive easements whenever possible to provide for public access and BLM control. Acquire temporary easements or nonexclusive easements, which do not provide for public access, consistent with management objectives and where no public access is needed.

Continue to obtain access across lands of private companies or individuals who are a party (permittee) to existing reciprocal rights-of-way agreements through appropriate agreements. Whenever a willing permittee is identified and it is determined there is a need for public access, negotiations could be started to provide for the acquisition of public access rights.

Emphasize acquisition for public access on major travel routes.

Withdrawals

Objectives

Protect lands with important resource values and/or significant levels of investment by withdrawing them from the operation of public land and mineral laws. Withdrawal is necessary to avoid irreparable damage that may be caused by nondiscretionary activities.

Land Use Allocations

Recommendations to maintain or revoke existing land withdrawals are shown in Appendix P.

BLM-proposed withdrawals are as follows:

	Approximate Acres
Seed Orchards and Progeny Test Sites	255
Quarry and Stockpile Sites	50
Dean Creek Elk Viewing Area	1,050
Cape Blanco	50
Pacific Ocean Coastline Recreation Sites/Areas	760
(2 Existing, 6 Proposed)	330
Special Areas (8 Proposed)	7,370

See Appendix Q for a listing of proposed withdrawals.

Management Actions/Direction

See Management of Newly Acquired Lands (toward the end of this chapter).

Complete the review of existing withdrawals to determine whether continuation of the withdrawal is consistent with the statutory objectives of the programs for which the lands were dedicated and with other important programs.

Terminate unnecessary or duplicative withdrawals and continue those that still meet the intent of the withdrawal.

Initiate action on the BLM-proposed withdrawals listed under land use allocations. This will involve recommendations to, and approval by, the Secretary of the Interior.

Evaluate future withdrawal proposals for compliance with program objectives and federal law, and recommend appropriate action to the Secretary of the Interior.

Limit withdrawals to the minimum area needed and restrict only those activities that would be detrimental to the purposes of the withdrawal.

Roads

Objectives

Develop and maintain a transportation system that serves the needs of users in an environmentally sound manner. Arterial and major collector roads will form the backbone of the transportation system in the planning area.

Correct problems associated with high road density by emphasizing the reduction of minor collector and local road densities where those problems exist.

Manage roads to meet the needs identified under other resource programs (e.g., seasonal road closures for wildlife). Road management is mentioned or implied primarily under Aquatic Conservation Strategy Objectives, Riparian Reserves, Late-Successional Reserves, Water Quality and Soils, Wildlife, Fish Habitat, Special Status and SEIS Special Attention Species Habitat, Timber Resources, and Recreation.

Land Use Allocations

There are approximately 1,810 miles of roads on BLM-administered land in the district.

Management Actions/Direction

Riparian Reserves

Cooperate with federal, state, and county agencies and work with parties with road use agreements to achieve consistency in road design, operation, and maintenance necessary to attain Aquatic Conservation Strategy objectives.

For each existing or planned road, meet Aquatic Conservation Strategy objectives by:

- Completing watershed analyses, including appropriate geotechnical analyses (i.e., examining soil and rock conditions in riparian and stream crossings), prior to construction of new roads or landings in Riparian Reserves.
- Minimizing road and landing locations in Riparian Reserves.
- Preparing road design criteria, elements, and standards that govern construction and reconstruction.

- Preparing operation and maintenance criteria that govern road operation, maintenance, and management.
- Minimizing disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow.
- Restricting sidecasting as necessary to prevent the introduction of sediment to streams.
- Avoiding wetlands entirely when constructing new roads.

Determine the influence of each road on the Aquatic Conservation Strategy objectives through watershed analysis. Meet Aquatic Conservation Strategy objectives by:

- Reconstructing roads and associated drainage features that pose a substantial risk.
- Prioritizing reconstruction based on current and potential impact to riparian resources and the ecological value of the riparian resources affected.
- Closing and stabilizing (or obliterating and stabilizing) roads based on the ongoing and potential effects to Aquatic Conservation Strategy objectives and considering short-term and long-term transportation needs.

Design and construct new culverts, bridges, and other stream crossings and improve existing culverts, bridges, and other stream crossings determined to pose a substantial risk to riparian conditions. New structures and improvements will be designed to accommodate at least the 100-year flood, including associated bedload and debris. Priority for upgrading will be based on the potential impact and the ecological value of the riparian resources affected. Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.

Minimize sediment delivery to streams from roads. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is infeasible or unsafe. Route road drainage away from potentially unstable channels, fills, and hillslopes.

Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams (e.g., streams which can be made available to anadromous fish by removing obstacles to passage).

Develop and implement a Road Management Plan or a Transportation Management Plan that meets the Aquatic Conservation Strategy objectives. As a minimum, this plan will include provisions for the following activities:

- Inspections and maintenance during storm events.
- Inspections and maintenance after storm events.
- Road operation and maintenance giving high priority to identifying and correcting road drainage problems that contribute to degrading riparian resources.
- Traffic regulation during wet periods to prevent damage to riparian resources.
- Establishing the purpose of each road by developing the road management objective.

Management Actions/Direction

Late Successional Reserves

Construct roads in Late Successional Reserves if the potential benefits of silviculture, salvage, and other activities exceed the costs of habitat impairment. If new roads are necessary to implement a practice that is otherwise in accordance with these guidelines, they will be kept to a minimum, routed through unsuitable habitat where possible, and designed to minimize adverse impacts. Alternative access—such as aerial logging—should be considered to provide access for activities in reserves.

Remove trees along rights-of-way if they are a hazard to public safety. Consider leaving material onsite if available coarse woody debris is inadequate. Consider topping of trees as an alternative to felling.

Management Actions/Direction

Key Watersheds

Reduce existing road mileage within key watersheds. If funding is insufficient to implement reductions, do not construct or authorize through discretionary permits a net increase in road mileage in Key Watersheds.

Management Actions/Direction

All Land Use Allocations

Prepare a district-wide road management plan after approval of the resource management plan. The management plan will specifically address recreation use, road densities, road closures, wildlife protection, water quality, Port-Orford-cedar management, timber management, construction and maintenance standards, fire suppression, and coordination with adjacent landowners. Address road management planning on a watershed basis consistent with Late-Successional Reserves, Riparian Reserves, and other major allocations. Specific road closures would be determined using standard analysis, public involvement, and notification procedures.

Determine standards for new road construction during the project planning process. Standards will be the minimum necessary to meet resource and allocation objectives (e.g., recreation site, timber sale, and key watershed) while having minimal impacts on the environment.

Minimize new road construction in areas with fragile soils to reduce impacts to soils, water quality, and fisheries. Stabilize existing roads where they contribute to significant adverse effects on these resources.

Conduct a geotechnical review on road design in areas of sensitive soils such as the serpentine and schists soils of Curry county. An inventory of existing unstable areas will be planned to stabilize those areas that pose sedimentation concerns or adversely affect other resources.

Specifically address—in the road management plan, watershed analysis, or in environmental assessment geotechnical review—options for stabilizing roads in sensitive soils and unstable areas.

Locate, design, construct, and maintain roads to standards that meet management objectives in accordance with the district road management plan.

Follow best management practices (see Appendix H) for water quality and soil productivity to mitigate adverse effects on soils, water quality, fish, and riparian habitat during road construction and maintenance.

Reduce road density by closing minor collector and local roads in areas or watersheds where water quality degradation, big game harassment, or other road related resource problems have been identified.

Acquire water rights for road management purposes.

Avoid road construction in special areas and special habitats as an alternative to other geotechnical repairs.

Manage non-through roads classified as local and located within rural interface areas and within 0.25 miles of existing dwellings to limit unauthorized public use activity that could contribute to public safety hazards, increased fire risk, and vandalism to private property. Gates and other types of traffic barriers (such as guardrails, berms, ditches, and log barricades) would be used as appropriate.

Reduce the further spread of blackstain fungus through proper timing of roadside brushing.

Consider the use of firewood sales as an option for the removal of roadside trees where they are obstructing sight distance.

Noxious Weeds

Objectives

Contain and/or reduce noxious weed infestations on BLM-administered land using an integrated pest management approach. Some noxious weeds expected to be subject to control are:

Common Name	Scientific Name
Purple loosestrife	*Lythrum salicaria*
Gorse	*Ulex europaeus*
Scotch broom	*Cytisus scoparius*
French broom	*Genista monospessulana*
Yellow starthistle	*Centaurea solstitalis*
Tansy ragwort	*Senecio jacobaea*
Maltgrass	*Nardus stricta*
Thistles	*Cirsium* spp.

Avoid introducing or spreading noxious weed infestations in any areas.

Land Use Allocations

No allocations are made for noxious weeds in the planning process.

Management Actions/Direction

Late-Successional Reserves

Evaluate impacts of non-native plants (weeds) growing in Late-Successional Reserves.

Develop plans and recommendations for eliminating or controlling non-native plants (weeds) that adversely affect Late-Successional Reserve objectives. Include an analysis of effects of implementing such programs on other species or habitats within reserves.

Management Actions/Direction

All Land Use Allocations

Continue to survey BLM-administered land for noxious weed infestations, report infestations to the Oregon Department of Agriculture (the department), and work with the department to reduce infestations.

Use control methods that do not retard or prevent attainment of Aquatic Conservation Strategy Objectives.

Apply integrated pest management methods (e.g., chemical, mechanical, manual, and/or biological) in accordance with BLM's multi-state environmental impact statement, *Northwest Area Noxious Weed Control Program*, 1985, as supplemented in 1987, and the related ROD.

Hazardous Materials

Objectives

Minimize the use of hazardous materials and eliminate known hazardous waste on BLM-administered lands.

Land Use Allocations

No allocations are made for hazardous material sites in the planning process.

Management Actions/Direction

Minimize the use of hazardous materials and eliminate known hazardous waste on BLM-administered lands.

Identify, investigate, and arrange for removal of hazardous substances on BLM-administered land in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Emergency response will be as specified in the District Hazardous Materials Contingency Plan. The response will include cleanup, proper notifications, criminal investigations, risk assessment, and other actions consistent with the Act and the nature of the emergency.

Store, treat, and dispose of hazardous materials and wastes in accordance with the Resource Conservation and Recovery Act (RCRA) and other appropriate regulations.

Use the Emergency Planning and Community Right-To-Know Act to coordinate emergency planning with other federal, state, and local jurisdictions concerning hazardous materials, emergency notifications, and required reporting of hazardous materials inventories and activities.

Ensure acquisitions are unencumbered by the existence of hazardous materials and features such as underground storage tanks following appropriate state and federal regulations.

Until hazardous materials on BLM-administered land are removed, protect employees, the public—and where possible the environment— from exposure to these materials.

Provide information and education to the public regarding the dangers of exposure to hazardous materials and the need to dispose of hazardous materials properly.

Investigate illegal hazardous materials activity on public lands, determine responsible parties, pursue recovery costs, and—where appropriate—prosecution under the laws pertaining to such activity.

Fire/Fuels Management

Objectives

Provide appropriate fire suppression responses to wildfires that will help meet resource management objectives and minimize the risk of large-scale, high intensity wildfires.

Use prescribed fire to meet resource management objectives. This will include—but not be limited to—fuels management for wildfire hazard reduction, restoration of desired vegetation conditions, management of habitat, management of fire dependent/adapted species, and silvicultural treatments.

Adhere to smoke management/air quality standards of the Clean Air Act and State Implementation Plan for prescribed burning.

Land Use Allocations

None specifically for fire/fuels management.

Management Actions/Direction

General

Apply the management actions/direction in the Special Status and SEIS Special Attention Species section.

Address fire/fuels management for all land use allocations as part of watershed analysis and project planning. This will include determinations of the role of fire and the risk of large-scale, high intensity wildfires at the landscape level.

Describe the need to use prescribed fire or other fuel management treatments to reduce fuel hazards and the risk of large-scale, high intensity fire, while maintaining coarse woody debris, down logs, green tree retention, and snags, consistent with the natural role of fire and protection standards for each land allocation unit.

Coordinate fire management activities in rural interface areas with local governments, agencies, and landowners. During watershed analysis, identify additional factors that may affect hazard reduction goals. Minimize the impacts of wildfire suppression actions.

Management Actions/Direction

Riparian Reserves

Design fuel treatment and fire suppression strategies, practices, and activities to meet Aquatic Conservation Strategy objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies will recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management activities could be damaging to long-term ecosystem function.

Locate incident bases, camps, helibases, staging areas, helispots, and other centers for incident activities outside of Riparian Reserves. If the only suitable location for such activities is within the Riparian Reserve, an exemption may be granted following a review and recommendation by a resource advisor. The advisor will prescribe the location, use conditions, and rehabilitation requirements. Utilize an interdisciplinary team to predetermine suitable incident base and helibase locations.

Minimize delivery of chemical retardant, foam, or other additives to surface waters. An exception may be warranted in situations where over-riding immediate safety imperatives exist, or—following a review and recommendation by a resource advisor—when an escape would cause more long-term damage.

Design prescribed burn projects and prescriptions to contribute to attainment of Aquatic Conservation Strategy objectives.

Immediately establish an emergency team to develop a rehabilitation treatment plan needed to attain Aquatic Conservation Strategy objectives whenever Riparian Reserves are significantly damaged by a wildfire or a prescribed fire burning outside prescribed parameters.

Limit the size of all wildfires.

Consider allowing some natural fires to burn under prescribed conditions. This decision will be based on additional analysis and planning.

Rapid extinguishing of smoldering coarse woody debris and duff should be considered to preserve these ecosystem elements.

Locate and manage water-drafting sites (e.g., sites where water is pumped to control or suppress fires) to minimize adverse effects on riparian habitat and water quality as consistent with Aquatic Conservation Strategy objectives.

Management Actions/Direction

Late-Successional Reserves

Emphasize maintaining late-successional habitat in wildfire suppression plans.

Use minimum impact suppression methods for fuels management in accordance with guidelines for reducing risks of large-scale disturbances.

During fire suppression activities, consult with an interdisciplinary team to assure that habitat damage is minimized.

Until a fire management plan is completed for a Late-Successional Reserve or group of reserves, suppress wildfire to avoid loss of habitat and to maintain future management options. Then, some natural fires may be allowed to burn under prescribed conditions.

Prepare a specific fire management plan prior to any habitat manipulation activities in Late-Successional Reserves. Specify how hazard reduction and other prescribed fire applications meet the objectives of the Late-Successional Reserve. Until the plan is approved, proposed activities will be subject to review by the Regional Ecosystem Office.

Apply prescribed fire in a manner that retains the amount of coarse woody debris determined through watershed analysis.

Consider rapidly extinguishing smoldering coarse woody debris and duff.

Management Actions/Direction

Matrix

Plan and implement prescribed fire treatments to minimize:

- Intensive burning, unless appropriate for certain specific habitats, communities, or stand conditions.
- Consumption of litter and coarse woody debris.
- Disturbance of soil and litter that may occur as a result of heavy equipment operation.
- Frequency of treatments.

Management Actions/Direction

All Land Use Allocations

Wildfire Suppression

Minimize the direct negative impacts of wildfire suppression on ecosystem management objectives.

Respond to all wildfires by taking appropriate suppression responses. In most cases, responses will consist of aggressive initial attack to extinguish fires at the smallest size possible.

For wildfires that escape initial attack, perform a Wildfire Situation Analysis to develop a suppression strategy to evaluate the damage induced by suppression activities compared to expected wildfire damage. Suppression tactics will consider:

- Public and firefighting personnel safety.
- Protection of specific attributes of each land use allocation.
- Coordination of wildfire suppression activities to avoid causing adverse impacts on federal and nonfederal lands.
- Appropriate use of suppression tools (such as aircraft, dozers, pumps, and other mechanized equipment) and clear definitions of any restrictions relating to their use.
- Potential adverse effects on meeting ecosystem management objectives.
- Protection of structural components such as snags, duff, and coarse woody debris to the extent possible.

Fuels Management (Including Hazard Reduction) Using Prescribed Fire

Modify fuel profiles to lower the potential of fire ignition and rate of spread; protect and support land use allocation objectives by lowering the risk of high intensity, stand-replacing wildfires; and, adhere to smoke management and air quality standards.

Reduce hazards through methods such as prescribed burning; mechanical or manual manipulation of forest vegetation and debris; removal of forest vegetation and debris; and combinations of these methods. Hazard reduction plans will be developed through an interdisciplinary team approach and will consider the following:

- Safety of fire fighting personnel.
- Identification of levels of coarse woody debris and snags of adequate size and in sufficient quantities to meet habitat requirements of species of concern.
- Developing a fuel profile that supports land allocation objectives.
- Reducing the risk of wildfire in a cost-efficient manner.
- Interagency cooperation to assure cost-effective fuel hazard reduction across the landscape.

- Adherence to smoke management and air quality standards.
- Consistency with objectives for land use allocations.
- Maintenance or restoration of ecosystem processes or structure.
- The natural role of fire in specific landscapes, current ecosystem needs, and wildfire hazard analysis included in the fire management plan.

Prescribed Fire Use for Ecosystem Maintenance and Restoration

The use of prescribed fire will be based on the risk of high intensity wildfire and the associated cost and environmental impacts of using prescribed underburning to meet protection, restoration, and maintenance of critical stands that are currently susceptible to large-scale catastrophic wildfire.

Underburning will be re-introduced across large areas over a period of time to create a mosaic of stand conditions. Treatments should be site-specific treatments because some species with limited distributions are fire intolerant. The use of prescribed burning will be based on an interdisciplinary evaluation. Accordingly, funding authority must reflect the range of objectives identified for using fire under ecosystem management.

Consider using prescribed fire to manage seral stage diversity through the development of fire-resistant stand mosaics by timing the application of fire.

Fuels Management for Hazard Reduction

Modify fuel profiles to lower the potential of fire ignition and rate of spread; protect and support land allocation objectives by lowering the risk of high-intensity, stand-replacing wildfires; and, adhere to smoke management and air quality standards.

Reduce hazards through methods such as prescribed burning; mechanical or manual manipulation of forest vegetation and debris; removal of forest vegetation and debris; and combinations of these methods. Hazard reduction plans will be developed through an interdisciplinary team approach and will consider the following:

- Providing for the safety of firefighting personnel.
- Identification of levels of coarse woody debris and snags of adequate size and in sufficient quantities to meet habitat requirements of species of concern.
- Developing a fuel profile that supports land allocation objectives while seeking a balance between reducing the risk of wildfire and the cost efficiency, consistent with meeting land allocation objectives.

Management Direction Common to Alternatives A through E

With a few exceptions noted in the text, the following management direction would apply fully to Alternatives A, B, D, and E. The No Action Alternative and Alternative C differ from the other alternatives in several respects which are noted in the descriptions of those two alternatives. Management direction common to all alternatives, including the PRMP, is located toward the end of this chapter.

General

Land management practices of adjacent landowners would be considered during site-specific land management planning.

Under all alternatives, site-specific planning by interdisciplinary teams (IDTs) comprised of relevant resource management disciplines would precede most on-the-ground management activities. The IDT process includes field examination of resources, selection of alternative management actions, analysis of alternatives, and documentation to meet National Environmental Policy Act requirements. Adjacent land uses would be considered during site-specific land management planning.

Many management activities described in this RMP/EIS would be accomplished through contracts and permits. Performance standards are developed and included in a contract or permit to require the contractor or permittee to comply with applicable laws, regulations, policies and plans. Selection of performance standards is governed by the scope of the action to be undertaken and the physical characteristics of the specific site. The standards, which include design features and mitigating measures, must be followed in carrying out an action.

Special management would be provided for the tree species Pacific yew, the bark of which is approved by the Federal Food and Drug Administration as a source of taxol, a promising agent for treatment of a variety of cancers. Special management would address harvest and regeneration of the yew, as well as the possible extraction of taxol without harvesting individual trees. Pacific yew harvest on federal lands was the subject of a separate Pacific Yew EIS prepared in 1993 by the U.S. Forest Service, with the BLM as a cooperating agency. Actions covered by this PRMP will be consistent with the *Record of Decision* for the *Pacific Yew EIS* (see Appendix C).

Inherent in all management practices is a goal of maintaining long-term site productivity of soils. Achievement of this goal would be accomplished by using best management practices (BMPs) and minimizing disturbance of fragile areas (see Appendix H for a list of BMPs and a description of management guidance for fragile sites). Figure 2-1 is an illustration of the Timber Production Classification System (TPCC), which includes two fragile categories.

All BLM-prescribed fire activities which could affect air quality would be conducted in accordance with the Oregon State Implementation Plan as administered by the Department of Environmental Quality, and the Oregon Smoke Management Plan as administered by the Department of Forestry.

The BLM would aid and support the state of Oregon Economic Development Department's efforts to help isolated, small communities develop and implement alternative economic strategies as a partial substitute for their faltering timber-based economies. Aid and support would consist mostly of coordination and prioritization of recreation management and development activities which are mutually perceived by the BLM and the involved communities as benefiting the identified economic strategies.

Water Quality, Wetlands and Riparian Areas

To assure protection of water and water-dependent resources, BLM would continue to implement a Non-Point Source (NPS) management program in cooperation with the U.S. Environmental Protection Agency (EPA) and the Oregon Department of Environmental Quality (DEQ).

Section 319 of the Clean Water Act directs the states to prepare a statewide management plan which outlines the NPS pollution control program. Oregon's NPS management program includes two goals for NPS prevention and control efforts: (1) protection, in every water body, of water quality necessary for full support of the various designated beneficial uses of water, and (2) maintenance of "high quality" waters wherever they are found. The Clean Water Act, as amended, directs federal agencies to comply with state water quality requirements to restore and maintain water quality necessary to protect identified beneficial uses.

Oregon's NPS management plan requires the BLM to continue coordination with DEQ for implementation of best management practices (BMPs) which are intended to protect the beneficial uses of water. The state of Oregon has identified beneficial uses and applicable water quality criteria for the Mid-Coast (OAR 340-41-242 and 245), Umpqua (OAR-340-41-282 and 285), South Coast (OAR-340-41-322 and 325) and Rogue Basins (OAR 340-41-362 and 365). Policy and guidelines, including antidegradation, generally applicable to all basins are listed in OAR 340-41-026 (1) (A).

Management activities would be planned to be consistent with Oregon's adopted Statewide Water Quality Management Plan for forest practices, and comply with Oregon's Water Quality Standards and Guidelines (OAR 340-41). BMPs would be selected based on site-specific conditions, feasibility, and the water quality standards for waters potentially affected. Mining, recreation, off-highway vehicle (OHV) use, and other activities would be regulated to protect water quality.

Degradation of water quality would not be permitted if there is potential for interference or injury to the established beneficial uses of water within designated reaches of a National Wild and Scenic River.

Floodplains and wetlands would be evaluated and protected in accordance with Executive Orders 11988 and 11990.

In accordance with the BLM Riparian-Wetlands Initiative for the 1990's, management would be directed at achieving the proper functioning condition of riparian-wetlands by:

- Restoration and maintenance of riparian-wetland areas.
- Protection of riparian-wetland areas and associated uplands.
- Partnership and cooperative restoration and management of riparian-wetland areas.
- An aggressive riparian-wetland information and education program including providing training and research.

Two measures provide the foundation for minimizing effects of land management activities on surface water. One protective measure is the exclusion of fragile non-suitable sites from the timber production base through the Timber Production Capability Classification (TPCC) process; the other is the commitment in the RMP to use design features that minimize soil erosion and otherwise protect streams. Analysis of indicators of cumulative effects by analytical watershed (included in the EIS for this RMP) may guide overall timber sale scheduling during the life of the plan. For additional guidance, see "Requirements for Further Environmental Analysis" and "Use of the Completed Plan" later in this chapter.

Both surface and ground water would be protected when implementing treatments involving chemicals (e.g., herbicides, pesticides, fertilizers, solvents, and fuels). Application and monitoring of effects of herbicides would be done in accordance with BLM's *ROD, Western Oregon Program-Management of Competing Vegetation*, 1992.

For those watersheds that provide surface water used by public water systems serving municipalities, the management goal would be to provide treatable water at the system's point of intake.

The following constraints would apply to management in and adjacent to riparian zones:

- Riparian Management Areas (RMAs) would be established on each side of streams, lakes, ponds and other waters. Figure 2-2 displays an example of an RMA.
- No timber harvest would be planned as part of the sustained yield timber management program within an RMA (generally 3rd order and larger) extending a minimum of 50 feet horizontal distance on each side of these perennial streams. The average distance may be wider, varying by alternative. Some tree cutting or timber harvest activities could occur within riparian zones, however, to achieve other resource management objectives. These exceptions could include some salvage sales, danger tree removal, and small forest product sales when the overall integrity of the riparian zone is maintained, or to re-establish conifers on sites occupied by hardwoods, or to provide large woody structure to the stream.

Permitted activities may include road construction perpendicular to the stream (i.e, stream crossings), enhancement of fish and wildlife habitat, and yarding corridors to facilitate timber harvest outside the RMA or to recover logs escaping from adjacent timber harvest areas.

- Snags, wildlife trees, and down logs adjacent to riparian zones would be retained as required to be consistent with the Oregon Forest Practices Act rules. Skid trail placement and burning would be restricted in accordance with those rules.

Guidance for riparian area management, in addition to the BMPs listed in Appendix H, would include the following standards:

- No surface occupancy would be permitted for leasable mineral exploration or development
- Conifers and woody riparian species would be planted in riparian areas adjacent to streams where such species have been removed by previous management activities. Placement of woody debris, or creation of snags, would be planned where appropriate to enhance riparian conditions.
- Vegetation could be manipulated to enhance springs and wetland areas.
- New water source development and reconstruciton of existing developments would be designed to protect riparian values.
- Riparian objectives would be achieved through improved livestock distribution and management by fencing, spring and other water source development, and changes in livestock numbers and/or season of use.

For certain riparian areas within the district, agreements would be pursued with private landowners and other land management agencies to minimize impacts from timber management, grazing or other activities.

New roads and associated structures would be located, designed and constructed in a manner that would minimize the number of stream crossings and the risk of soil and other material entering streams or other waters. Excavation would be limited to the practical amount needed to meet appropriate road standards. Exposed soil would be stabilized and revegetated. Logging, road building, and slash disposal methods would be designed to minimize the number and/or size of mass soil movements. Roads to be added to the permanent road system would generally be surfaced, have drainage structures installed, and be routinely maintained. On a case-by-case basis, temporary roads would be "put to bed" upon completion of use.

Timber

All lands available for the management of forest products are considered capable of being reforested within five years after harvest and of being managed without irreversible resource damage. Land categories allocated for intensive management of forest products are shown in Figure 2-1.

All timber harvest and many forest development activities are accomplished through contracts and are usually awarded competitively. The standard and special contract provisions (which include mitigating measures) define performance standards that the contractor must follow subject to applicable laws, regulations, and policies.

Selection of special contract provisions depends on the scope and physical characteristics of the specific proposed action and physical characteristics of the specific site. The standard provisions of the basic timber sale contract are applicable for all timber sales. Bureau manuals, manual supplements, and handbooks provide a variety of approved special provisions for use, as appropriate, in individual contracts. The combination of selected special provisions constitutes Section 41 of the timber sale contract.

Transportation System

New roads would be constructed only to the extent needed for management; they would be located, designed, and constructed to standards appropriate to expected road use and resource values affected. Road construction for timber sale contracts would comply with BLM Oregon Manual Supplement H-5420-1, which is available for review at the district office. Construction standards (e.g., stream crossing requirements, subgrade width, ditch, cut-and-fill slope requirements, and type of surfacing) would be determined during the annual timber sale planning process.

Timber Harvest

On lands allocated primarily for intensive management of forest products, clearcut harvesting would be used where silviculturally essential to accomplish relevant forest management objectives, including cost-effective management and assurance of timely reforestation. Under those criteria, clearcut harvesting would be the timber harvest method to be commonly employed except in Alternative C and the Proposed RMP.

All silvicultural systems would be sustainable, economically practical, and capable of maintaining the long-term health and productivity of the forest ecosystem. Silvicultural systems under each alternative would include the following:

- Genetically-selected planting stock would be utilized consistent with the alternative design features (see Appendix L for a description of the genetics program).

- Growth-enhancing practices such as commercial thinning and fertilization would be utilized.

Silvicultural systems and practices considered in the common alternatives were discussed in Appendix II-E of the draft RMP.

Trees could be cut or removed from land not available for the management of forest products for the following reasons unless their harvest would be inconsistent with other plan guidelines for management of the area:

- Harvest inclusions of trees within a harvest unit on lands mostly classified as suitable for timber production, to allow design of more logical management units and/or reduced road construction, thereby lessening net adverse environmental impacts.

- Salvage trees or stands killed or substantially damaged by fire, windthrow, or other catastrophe.

- Control the spread of insect or disease outbreaks.

- Conduct experiments.

- Provide for the safety of forest users (this includes hazard tree removal in campgrounds, picnic grounds, and administrative sites; and along trails and roads open to the public).

- Maintain or enhance fish and wildlife habitats.

- Improve the visual resource by opening scenic vistas.

- Provide guy line or tailhold anchors where needed to facilitate logging on adjacent lands.

- Facilitate construction of new facilities such as roads, trails, power lines, communication, administrative, and recreation sites.

- Eliminate interference with the operation of microwave relay stations.

- Facilitate mineral exploration or development.

- Develop quarry sites.

To the extent consistent with the direction for wildlife habitat management, the sale of forest products would be designed to encourage complete utilization of harvested timber including noncommercial species.

Yarding Systems

Timber harvest would be accomplished by a mix of aerial, cable, and ground yarding systems. This variety of logging systems and the degree of log suspension are design features employed primarily to protect watershed and minimize soil damage. Selection of timber harvesting techniques is guided by BLM Oregon Manual Supplement Timber Sale Procedure Handbook H-5420-1, and BLM Oregon Manual Supplement Timber Production Capability Classification 5251-1.

In timber sales involving ground yarding systems, skid trails (including trails from previous harvest entries) would be planned to have insignificant (less than one percent) growth-loss effect. Skid trails would affect less than 12 percent of the harvested area. Existing skid trails would be used as much as possible and new skid trails would be limited to slopes less than 35 percent. Operation on these trails would be restricted to minimize soil displacement and occur when soil moisture content provides the most resistance to compaction. Skid trails from previous entries would be selectively tilled with a properly-designed self-drafting winged subsoiler, or the equivalent. For entries other than final harvest, skid trails would be selectively tilled.

Special Forest Products

Extraction of special forest products (e.g., firewood, shake and arrow bolts, burls, fence posts, ferns, and floral greens) would be accommodated on lands available for such harvest, to the extent of product availability, and funding to administer transactions. Sales are normally made on a negotiated basis, with the permit or contract containing applicable stipulations for the protection of other resource values.

In an attempt to mitigate air pollution related to firewood burning, copies of Oregon Department of Environmental Quality publications that promote burning of dry wood and make other recommendations for reducing wood stove emissions would be made available.

Special Status (Including Threatened and Endangered Species) Habitat

Consistent with policy identified in BLM's nationwide Fish and Wildlife 2000 Plan, habitats of federally listed or proposed threatened or endangered species would be protected, monitored, and managed, as required by law. Prior to any vegetative or ground manipulation, or any disposal of BLM-administered land, a review of the affected sites or tracts would be conducted for such species. (The alternatives do not assume that required levels of protection of listed or proposed species are known unless there was a recovery plan in effect before the alternatives were formulated. Thus, for instance, some alternatives provide no specific allocations for the protection of spotted owls, although most alternatives include allocations that provide some protection for spotted owl sites.)

If a project may affect any federal threatened or endangered species or its habitat, efforts would be made to modify, relocate, or abandon the project to obtain a "no effect" determination. Where BLM determines that such a project cannot be altered to eliminate the potential effect, and abandonment of the project is not considered appropriate, consultation with the U.S. Fish and Wildlife Service would be initiated. All actions would be consistent with the Pacific Bald Eagle, Peregrine Falcon, and Aleutian Canada Goose Recovery Plans. Known habitat sites and potential sites identified in the Recovery Plan Implementation Plans would be protected.

Habitat management plans would be developed and implemented, incorporating the management actions for all presently known federally-listed species occurring on BLM-administered lands within the district. The habitat management plans would be reviewed periodically by the BLM and USFWS to determine whether modifications are necessary.

Pursuant to Bureau policy and the objectives of Fish and Wildlife 2000, and as funding permits, inventories and studies would be conducted on special status species where baseline information is currently lacking.

Wildlife Habitat

Wildlife and fish habitat management would be in conformance with the goals and objectives of BLM's nationwide Fish and Wildlife 2000 Plan, and the Riparian-Wetland Initiative for the 1990s.

Nonmerchantable down, dead woody material would be retained on areas where timber is harvested to the extent compatible with reforestation objectives, fire hazard reduction standards, and watershed protection objectives. Gross yarding would be planned only where needed for one of these purposes. Down, dead material would be salvaged from lands subject to retaining an adequate amount of such material for habitat to maintain populations of small animals.

Snags would be retained, except where they are a fire hazard and where public safety is a concern, where they occur on lands not allocated to timber production, and where left as nonmerchantable material in timber harvest units. Also, where relevant to meeting cavity nester objectives, and when funding permits on lands not allocated to timber production, some green trees would be girdled or topped to create snags. Timber sale contracts would encourage loggers to retain all snags and nonmerchantable trees that can be safely left in timber harvest areas. In alternatives providing for retention of wildlife trees that may be merchantable in timber sale areas, the following guidelines would be used:

- Leave all soft snags except where unacceptable for safety, logging systems, or burning considerations.

- Leave scattered hard snags and green trees, to provide for the current needs of hard-snag-dependent species and to serve as a source of future snags and down wood. Green trees retained would be cull trees where available. If cull trees are not available, sound trees would be retained for this purpose.

New roads would be located, wherever practical, to avoid areas with high wildlife values. Spur roads not essential for continued timber management would be closed. Other roads in sensitive wildlife habitats would be closed to general public travel by motorized vehicles, but could remain open for administrative and emergency use, forest products removal, and access for mineral exploration and development. (See Recreation for more detail.) Closures may be by gates, physical barriers, or signing.

Precommercial thinning projects would provide for maintaining major game trails free of slash accumulations that impede big game movement, based on site-specific needs.

Special habitats such as lakes, talus slopes, meadows, and wetlands would be managed to protect their primary habitat values. Rock quarry development may occur on cliffs or talus slopes not occupied by special status species. IDT review would be conducted on a site-by-site basis to assess the significance of special habitats.

Forage seeding would be done following clearcut harvesting in any big game management area where less than 20 percent of the land is in the early seral stage and where compatible with continued timber production.

Any leasable mineral exploration and development activities would be allowed only to the extent that unique habitats are not degraded.

When practical, timber sale contracts would require removal of debris which obstructs fish passage or has the potential to degrade a stream channel. All other large woody debris and snags in and adjacent to fishery streams would be retained. Stream crossing structures would be installed so that fish passage is not impeded.

Consistent with BLM's national Fish and Wildlife 2000 Plan, the fisheries potential of anadromous fish streams would be enhanced to the extent of available funding, and all uncompleted fish habitat improvement projects identified in BLM's 1985 Five-Year Comprehensive Anadromous Fish Habitat Enhancement Plan for Oregon Coastal Rivers would be completed. In addition, there are a number of other potential projects that have significant but correctable limiting factors. Proposed correction would either provide a positive benefit/cost ratio, or mitigate problems caused by past activities. Those projects would be undertaken, to the extent of available funding, during the life of the plan. Table 2-3 shows a priority listing of the remaining projects in the five-year plan and other identified projects. Additional projects may be identified as stream inventories are conducted. See the previous Water Quality discussion for riparian management direction relating to wildlife and fish habitat.

Additional Opportunities for Fisheries and Recreation

There may be additional opportunities as indicated in the District's Fish & Wildlife 2000 Plan for the acquisition of lands to benefit riparian habitat and instream fisheries habitat management. Other opportunities which may be pursued in the future include the acquisition of the anadromous salmon rearing and release facility on the North Spit of Coos Bay.

Special Areas

Existing Areas of Critical Environmental Concern (ACECs) selected for continued management as ACECs would be managed generally in accordance with site-specific ACEC management plans or guidelines equivalent to those in the current land use plan for ACECs without approved ACEC management plans.

Recreation

Increased emphasis would also be placed on accomplishing the goals and objectives of BLM's Recreation 2000 Implementation Plan and the initiatives for the Oregon-Washington Special Recreation Management Areas and Extensive Recreation Management Areas.

Principal recreation objectives would be to: provide a broad range of recreation opportunities to meet public needs; maintain high quality recreation facilities; maintain or enhance recreational resource values to ensure the continued availability of high quality outdoor recreation opportunities; upgrade existing recreation sites and areas to meet section 504 of the Rehabilitation Act of 1973; and assist local economic growth and diversity by providing for tourism, recreational use, and development on BLM-administered lands. These objectives would be accomplished through a mix of facilities provided by BLM, other public agencies, partnerships, and, where appropriate, privately-operated on BLM-administered lands.

Most BLM-administered lands in the planning area would be designated as Extensive Recreation Management Areas. These lands would be available for dispersed recreation activities, including hunting, fishing, sightseeing, riding, hiking, and rafting, consistent with other resource management objectives. All BLM-administered lands would be open to recreational mineral collection (casual use) unless subject to prior rights, such as mining claims.

County parks managed and maintained by Coos County on BLM-administered lands would be retained. These include three existing parks (Laverne, Laverne expansion, and Frona) and three potential parks (Middle Creek, Rock Prairie, and Judge Hamilton).

Off-Highway Vehicle (OHV) use on BLM-administered lands would be regulated in accordance with the authority and requirements of Executive Orders 11644 and 11989, and regulations contained in 43 CFR 8340. Accordingly, OHV use would be managed to avoid significant adverse impacts to resource values, and in a manner that would minimize conflicts between visitors. Emphasis would also be given to identifying public hazards and promoting public safety.

The following areas would be closed to OHVs or motorized public access on a year-round basis:

- Wilderness Areas
- Wilderness Study Areas
- Research Natural Areas
- Progeny test sites
- Dean Creek Elk Viewing Area
- Fenced snowy plover areas on the North Spit of Coos Bay
- BLM-administered lands in the New River ACEC

Off-highway vehicles and motorized public access would be restricted to existing or designated roads in the following areas:

- ACECs, including acquired lands associated with these special areas
- Riparian management areas
- Wetlands
- Recreation sites
- Potential wild and scenic river corridors

Roads, and subsequently motorized access within the following areas would be seasonally closed to OHVs:

- Bald eagle nesting areas
- Snowy plover nesting areas

Increasing emphasis would be placed on interpretive and informational signing and maps to support state and local strategies for encouraging tourism.

Wild and Scenic Rivers

The BLM uses a three-step process for the study of potential wild and scenic rivers. The first step is to determine eligibility, the second is to determine potential classification, and the third is to determine suitability. Final decisions concerning designation of wild and scenic rivers is reserved by Congress.

Determinations of eligibility and classification, using the wild and scenic rivers criteria listed in Appendix II-G of the Draft RMP, were completed in 1991.

Documentation for these determinations is maintained in the Coos Bay District Office. Suitability findings for Alternatives A through E were based on State Director's guidance (Appendix B).

The corridor width for all rivers found eligible or studied for suitability is defined as 0.25-mile on either side of the river (0.5-mile wide corridor). Until Congress acts on study recommendations, interim management of BLM-administered land within the 0.5-mile corridor would be provided to protect outstandingly remarkable values (ORVs) for all streams found eligible but not studied by BLM in this RMP (generally, those segments where BLM administers less than 15 percent of the land base within the 0.5-mile corridor) and for all streams studied and found suitable. Under interim protective management, no actions would be authorized on BLM-administered lands within the 0.5-mile corridor that would adversely impact the ORVs which resulted in rivers being found eligible/suitable. Management guidelines and standards for designated national wild and scenic rivers, which also apply to segments under interim management, are described in Appendix I. River segments found not suitable through the RMP process would be subject to interim management which would cease on completion of the Record of Decision.

Interim management for potential recreational rivers would exclude timber harvest in the riparian management area, severely restrict development of leasable and salable minerals, and protect the segments' free flowing values and identified ORVs. Interim management for potential scenic rivers would exclude timber harvest in the riparian management area, provide Visual Resource Management Class II management in the 0.5-mile corridor, and protect the segments' free flowing values and identified ORVs. Interim management for potential wild rivers would exclude timber harvest and other disturbing activities within the 0.5-mile corridor, except for exploration and development of locatable minerals which would be restricted but not prohibited.

Wilderness and Wilderness Study Areas

One designated Wilderness Area (Squaw Island), two Wilderness Study Areas (Zwagg Island and North Sisters Rocks), and one Instant Study Area (Cherry Creek) are located within the district. Management of these areas is described below.

Squaw Island and two other rocks at the north end of Sunset Bay (totaling approximately five acres) were added to the Oregon Islands Wilderness in 1978. No action will be permitted that would diminish their wilderness characteristics.

Management of Zwagg Island and North Sisters Rocks (totaling approximately eight acres) will comply with the Bureau's Interim Management Policy until Congress acts to designate or not designate these areas as wilderness.

Cherry Creek (590 acres) will be managed as a Research Natural Area, which is in conformity with the Bureau's Interim Management Policy for Instant Study Areas.

The Squaw Island Wilderness Area and several unsurveyed rocks and islands above the mean high water elevation offshore from the coast of Oregon not included in the Oregon Islands National Wildlife Refuge System will be managed in accord with the existing plan. An aggregate of approximately 12 acres are involved. Pursuant to interim management, no action will be authorized that would diminish the suitability of these areas for inclusion in the wilderness system.

The alternatives address management options if Congress does not designate the areas as wilderness. If, however, Congress does designate the areas as wilderness, their management would be determined by the specific designation.

Visual Resources

All BLM-administered lands are assigned to Visual Resource Management (VRM) classes as described in Bureau Handbook 8410-1. The VRM classes and objectives are as follows:

Class I: The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

Class II: The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Class III: The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Class IV: The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating of basic elements.

Management on VRM Class II lands would be consistent with the visual management objectives for this class, as determined on a site-specific basis through the project planning process. Examples of how a timber sale could be planned and designed to meet the objectives include:

- In areas seen from roads and major viewpoints, harvest systems may include single-tree selection, uneven-aged harvest, retention of shelterwood overstory trees, or small (generally 3-5 acre) clearcuts.
- Larger clearcuts would be allowed where they can be fully screened from roads and major viewpoints, or where their boundaries can be sculptured to achieve the appearance of natural openings and meadows.
- Shelterwood retention would usually involve deferring harvest of 100-120 square feet of basal area (approximately 50 percent of the basal area) and not completing overstory removal until the understory meets visual standards (usually about age 40).
- Helicopter removal would be considered when road construction would impair visual

quality, and where harvest systems require aerial removal.

To permit screening of clearcuts and time for regrowth between sequential entries, clearcut harvests would not remove more than 6.6 percent of the VRM Class II area in a given decade.

Harvested areas would be regenerated with a variety of species, and young stands would be intensively managed. When consistent with management for other resources, harvested areas would also be forage seeded to promote rapid visual recovery.

Similar techniques could be used with other management activities. Management approaches to meet VRM Class III objectives would be determined on a site-specific basis and would employ either short-term retention of shelterwood overstory trees, or use of clearcuts which have less than ten acres of seen area, and which do not disturb more than ten percent of the seen VRM Class III area in any decade. Where possible, clearcuts would be screened from the observer by uncut areas, shelterwood units, or young stands.

No specific visual management constraints would apply to lands managed for VRM Class IV objectives, but mitigation of visual impacts would be incorporated where consistent with efficient timber harvest or other management activities.

Cultural Resources

BLM would continue to identify localities with cultural resource values, and manage for their public and scientific uses. This objective would largely be accomplished through implementation of 36 CFR 800, which ensures that authorized land use actions do not inadvertently harm or destroy federal or non-federal cultural resources, but would also include affirmative measures to protect and enhance cultural resources. The affirmative measures would be largely a result of the 1988 Archeological Resources Protection Act (ARPA) amendments and the Bureau initiative, "Adventures in the Past." The ARPA amendments direct federal agencies to inventory and evaluate their cultural resources, and to develop public awareness programs to explain their significance. "Adventures in the Past" helps attain those goals by emphasizing enhanced public enjoyment and awareness of the resources. In addition to being dependent on funding, implementation of these measures would be susceptible to change based on the accumulation of new data. Cultural resource protection measures include:

- Systematic inventory of areas likely to contain cultural resources.
- Systematic testing and evaluation of archeological sites to assess their potential for contributing to public and scientific uses.
- Development of cultural resource management plans for areas with fragile resources or a record of intensive prehistoric or historic use. These areas would include: the North Spit of Coos Bay in the Tioga Resource Area, and New River in the Myrtlewood Resource Area. Cultural plans would also be prepared for other areas where significant cultural resources are present.
- Development of long-term inventory strategy plans based on geomorphic provinces of the Coast Range and Klamath Mountains.
- Acquisition of significant cultural resource properties for conservation and scientific purposes. These properties would include sites on the North Spit of Coos Bay and the New River Area.
- Development of Memoranda of Understanding with local Indian groups to promote appropriate consideration of their heritage and religious concerns. These groups include the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians, Inc.; the Coquille Indian Tribe; and the Tolowa Tribe.
- Systematic monitoring by law enforcement personnel of selected sites along the Pacific Ocean coast line and in the North Fork Chetco River area.
- As part of the "Adventures in the Past" initiative, interpretation of cultural resources to increase public awareness and appreciation of the resource values.
- Implementation of physical protection measures, such as riprapping and barrier installations, to reduce deterioration.

Land Tenure

Land tenure adjustments are made through both acquisitions and disposals. Acquisitions may occur by land purchase, donation, exchange, or transfer of jurisdiction from another federal agency. Disposals occur by sale, exchange, transfer of jurisdiction to another federal agency, and by infrequent sales or transfers under legal authorities such as the Color-of-Title Act, the Recreation and Public Purposes Act, and specific special acts of Congress.

All land tenure adjustments would consider the effect on the mineral estate. If the lands are not known to have mineral potential, the mineral interest would normally be transferred simultaneously with the surface.

Land ownership adjustment criteria are identified in Appendix O, which also lists factors that would be considered in the NEPA documentation process and decision records prepared for specific adjustment proposals.

Land tenure adjustments will be guided by a three-zone concept utilizing the following standards:

- Zone 1 (High Priority) includes areas currently identified as having high public resource values, and other efficiently managed lands. The natural resource values may require protection by federal law, Executive Order, or policy. These lands may have other values or natural systems that merit long-term public ownership. They do not meet the criteria for sale under FLPMA Section 203(a), and would generally be retained in public ownership.

- Zone 2 (Moderate Priority) includes lands that meet criteria for exchange because they form discontinuous ownership patterns, may be relatively inefficient to manage, and may not be accessible to the general public. These BLM-administered lands may be blocked up in exchange for other lands in Zones 1 or 2, transferred to other public agencies, or given some form of cooperative management. These lands would not be sold under Section 203(a).

- Zone 3 (Low Priority) includes lands that are scattered and isolated with no known unique natural resource values. Zone 3 lands would be available for use in exchanges for private inholdings in Zone 1 (high priority) or Zone 2 (moderate priority). They are also potentially suitable for disposal through sale under FLPMA Section 203(a), if important recreation, wildlife, watershed, threatened or endangered species habitat and/or cultural values are not identified during disposal clearance reviews and no viable exchange proposals for them can be identified. Zone 3 lands would also be available for transfer to another agency or to local governments, as needed, to accommodate community expansion and other public purposes.

Lands in the three zones would be the same in all alternatives as shown on Map 2-1. Zone 3 lands are identified in Appendix N.

Lands will be acquired where directed by Congress, including lands to be purchased with funds appropriated from the Land and Water Conservation Fund.

Land to be acquired by the BLM through exchange or purchase generally must meet one of the following criteria:

- Facilitate access to public land and the management of resources.

- Maintain or enhance important public values and uses.

- Maintain or enhance local social and economic values in public ownership.

- Facilitate implementation of other aspects of the approved Resource Management Plan.

Lands having resource values warranting consideration for acquisition by BLM under one or more of the alternatives have been preliminarily identified and are shown on maps available for inspection in the district office. Additional lands worthy of acquisition consideration may be identified over time, and future investigation of specific parcels shown on the maps may result in some tracts being dropped from consideration. Acquisition of these lands, if it occurs, would be only from willing landowners by exchange (predominantly), donation, or by purchase at fair market value when funding and purchase authority is available.

Exchanges will be made only to enhance public resource values and/or improve land patterns and management capabilities of both private and BLM-administered lands within the planning area by consolidating ownership and reducing the potential for land use conflict. Adjustments involving sales or exchanges may be made based on site-specific application of the land ownership adjustment criteria.

Transfer to, or acquisition from, other public agencies will be considered where consistent with public land management policy and where improved management efficiency would result. Consideration would be given to the realignment of the Coos Bay/ Roseburg and Coos Bay/Medford BLM District boundaries and sustained yield boundaries to administratively transfer jurisdiction of land to the district managing the land.

Sales

Most sales of BLM-administered lands are conducted under the authority of Section 203 of the Federal Land Policy and Management Act of 1976 (FLPMA), which requires that one of the following conditions exist before land is offered for sale:

- Such tract, because of its location or other characteristics, is difficult or uneconomical to manage as part of the BLM-administered lands and is not suitable for management by another federal department or agency.
- Such tract was acquired for a specific purpose and the tract is no longer required for that or any other federal purpose.
- Disposal of such tract will serve important BLM-administered objectives, including but not limited to, expansion of communities and economic development, which cannot be achieved prudently or feasibly on land other than BLM-administered land and which outweigh other public objectives and values, including, but not limited to, recreation and scenic values, which would be served by maintaining such tract in federal ownership.

In addition to these criteria, revested O&C and Coos Bay Wagon Road lands must be found to not be suitable for management and administration for permanent forest protection and other purposes as provided for in the Act of August 28, 1937 (O&C Act) before they can be offered for sale.

Additional small public land tracts that are presently unknown, primarily hiatuses between Donation Land Claims and the regular rectangular subdivisions of sections, may be discovered by future cadastral surveys. Where such tracts meet the legal sales criteria cited above, they will be considered to be automatically assigned to Zone 3.

It is further anticipated that future surveys will identify encroachments of residential improvements and agricultural development from adjoining private lands. Such encroachments usually occupy less than an acre of public land. Where the lands actually encroached upon are assigned to Zone 2, are not suitable for permanent forest management, meet one of the three conditions cited above, have inadvertent encroachment, and have improvements of more than nominal value and utility, the encroached lands will be considered to be automatically reassigned to Zone 3.

Disposals under the Color-of-Title Act, as amended, will be made when an applicant can establish that the legal requirements of the Act have been met for Class 1 claims in all zones. For Class 2 claims, disposals will be made in Zones 2 and 3 when the requirements of the Act are met, unless important recreation, wildlife, watershed, special status species habitat and/or cultural values are identified during disposal clearance reviews for individual tracts. No tracts with pending or potential Color-of-Title claims are presently known.

Disposals under the Recreation and Public Purposes (R&PP) Act, where otherwise consistent with the provisions of the plan, would be made based upon the site-specific application of the land ownership adjustment criteria. No lands are presently identified for disposal under the R&PP Act. No sales under authorities other than those discussed above are anticipated.

Leases and Permits

BLM-administered lands would continue to be available for a wide variety of miscellaneous commercial land uses through approval of leases and temporary use permits authorized by Sec. 302 of FLPMA, leases authorized by the R&PP Act, and Special Recreation Permits. BLM will protect or enhance the various resource values when considering applications or requests for the use of BLM land. Prior to BLM approval of a lease or permit, the applicant would be required to submit plans, maps and other information related to the proposal for evaluation. Each lease or permit would be limited to the area necessary for operation and maintenance. Approvals would consider the protection of public safety, be consistent with the RMP, and provide for minimizing damage to the environment.

No areas for new leases under Section 302 of FLPMA or the R&PP Act are identified. Any future requests or applications for new leases or permits will be considered on a case-by-case basis.

New land use authorizations could be made in all zones to resolve agricultural and occupancy trespasses provided that such authorizations would be consistent with other provisions of the plan and would not adversely impact important recreation, wildlife, watershed, special status species habitat, and/or cultural values.

No leases or permits under any authority would be allowed for landfills or other solid waste disposal facilities, nor for any proposals involving the use, storage or disposal of hazardous materials.

Unauthorized Use

Unauthorized realty uses of BLM-administered land include: agricultural cultivation; grazing; occupancy; unlawful enclosures and exclosures; and right-of-way facilities such as roads, powerlines and pipelines. Unauthorized uses will be resolved in a timely manner. Unauthorized users are responsible for the payment of fair market rental for current and past years of unauthorized use and full reimbursement for administrative costs, rehabilitation and stabilization.

Rights-of-Way

BLM-administered lands would continue to be available for needed rights-of-way where consistent with local comprehensive plans and Oregon statewide planning goals and rules. Applications outside of exclusion areas will be considered on a case-by-case basis. BLM will protect or enhance the various resource values when considering applications for new rights-of-way. Prior to BLM approval, the applicant would be required to submit plans, maps and other information related to the proposal for evaluation. Each right-of-way grant would be limited to the area necessary for operation and maintenance, and would include appropriate stipulations from BLM Manual Handbook H-2801-1. Approvals would consider the protection of public safety, be consistent with the RMP, and provide for minimizing damage to the environment.

Utility/transportation routes (for electric transmission, as distinguished from distribution, facilities; pipelines 10 inches in diameter or larger; significant canals, ditches and conduits; railroads; aerial communication lines for interstate use; federal and state highways and major county roads) would be confined to existing and other designated corridors, which are shown on Map 2-11. Corridor widths vary depending on the number of parallel facilities. Applicants will be encouraged to locate new facilities (including communication sites) adjacent to existing facilities to the extent technically and economically feasible.

Communications facilities would be allowed on existing communication sites, also shown on Map 2-11. Identification of additional communication sites are anticipated during the life of this plan. All sites with approved communication site management plans will be managed according to the provisions of the plan. Communication facilities on sites other than those shown on Map 2-11 will be considered on a case-by-case basis. Applications may be approved where the applicant can demonstrate that use of a designated communication site is not technically feasible, and where the proposed facility would otherwise be consistent with the RMP and provide for minimizing damage to the environment.

All Research Natural Areas (RNAs), VRM Class I areas, and rivers suitable for wild status would be considered right-of-way exclusion areas (where future rights-of-way may be granted only when mandated by law), except for buried utility lines or pipelines located within the rights-of-way of existing roads.

All existing and proposed wilderness areas; recreation sites; ACECs other than Research Natural Areas; rivers suitable for scenic status; and areas identified as having threatened or endangered, proposed, Candidate (Category 1 or 2), state listed or Bureau sensitive plant or animal species, would be avoidance areas. In these avoidance areas, future rights-of-way may be granted only when no feasible alternative route or designated right-of-way corridor is available. Exceptions will be made for buried utility lines or pipelines that can be installed within the rights-of-way of existing roads without adversely affecting the plant and animal species referenced above. Areas identified for VRM Class II management will be avoided or appropriate mitigation measures taken.

On August 10, 1988, the Northwest Power Planning Council amended its Northwest Conservation and Electric Power Plan to prohibit future hydroelectric development on rivers and streams with significant fisheries and wildlife resource values. In accordance with that plan, rights-of-way authorizing new hydropower development will not be approved on watercourses identified in the plan or amendments thereto. For lands acquired in the future, hydroelectric development will not be allowed on any rivers or streams designated as protected in the Northwest Conservation and Electric Power Plan.

Access

Road easements for administrative and timber harvest purposes will be acquired where needed to support timber management or other programs. Perpetual Exclusive Easements will be negotiated with landowners whenever possible to provide public access to lands of the United States. Non-exclusive easements—which do not provide access for the public—will be negotiated when consistent with management objectives. Temporary easements will only be utilized when no other options are available. Condemnation authority will be used when necessary.

Acquisition procedures will be completed as described in BLM Manual Handbook H-2101-1. There are currently numerous scattered tracts of timber located within the district boundaries. As specific tracts are identified as to type of access needed, acquisition actions will be started consistent with management objectives for the specific tract.

Access across lands of private companies and individuals who are party (permittee) to existing reciprocal right-of-way agreements will continue to be obtained through use supplements, amendments, or assignment of the agreements. Whenever landowners not party to a right-of-way agreement identify a need for access across lands of the United States, and the BLM needs access across lands of the landowner, new reciprocal right-of-way agreements will be considered.

Access gained by the United States under terms of reciprocal right-of-way agreements do not provide for public access via roads or lands owned by the permittee to roads or lands owned and controlled by the United States. Whenever a willing permittee is identified, and it is determined there is a need for public access, negotiations could be started to provide for the acquisition of public access rights.

Acquisition for access for other programs such as recreation, water quality, or wildlife habitat will be completed as necessary. Access will be based on the program needs identified in the acquisition document.

Withdrawals

Appendix P displays existing land classifications and withdrawals which are recommended for continuation, full or partial termination, revocation or modification, and the rationale for such recommendations. Those lands recommended for revocation or termination would be managed by BLM for timber production, wildlife, recreation, and other resource values as provided elsewhere in this plan. Those portions of the listed classifications and withdrawals not recommended for revocation, termination, or modification are recommended for continuation.

The Power Site Reservations, Power Site Classifications, and Water Power Designations listed in Appendix P have not yet been reviewed. Reviews for these withdrawals will include site evaluations for water power potential and will consider the historical and current demand for water power at the individual sites, the size of the withdrawals in relation to the need for a reservoir or other facility, the water rights that may need to be established, and site feasibility studies. It is recommended that, upon completion of reviews of these withdrawals, they be continued on those lands found to still be valuable for future hydropower development, and revoked on those lands that are found to no longer be valuable for future hydropower development.

New Withdrawals

The potential exists for additional withdrawals relative to new proposals for acquisition and/or development of special concern areas being expected over the next decade. A withdrawal would be considered whenever existing regulations do not adequately guarantee protection of the improvements or resources, or whenever additional lands are acquired to enlarge the size of existing special concern areas.

Energy and Minerals

Leasable Minerals

Several lease notices would be in effect for all lands in the operating area under all alternatives. The notices pertaining to the northern spotted owl, American peregrine falcon, special status animals and plants, and cultural resources are shown in Appendix II-K of the draft RMP. Standard oil and gas lease stipulations as listed in Section 6 of “Offer to Lease and Lease for Oil and Gas” Form 3100-11 are also displayed in Appendix II-K of the draft RMP. Special stipulations for each alternative are shown in Appendix II-K of the draft RMP and would be attached to oil and gas leases to provide additional protection for fragile areas or critical resource values. The special stipulations include the powersite stipulation, controlled surface use, and no surface occupancy. The powersite stipulation would be used for any lands within a powersite designation.

The controlled surface use stipulation would be used on lands having fragile soils or classified as VRM Class II. This stipulation is used instead of the more restrictive no surface occupancy stipulation because there are existing roads through these tracts, which could be used in leasable mineral exploration and development.

The no surface occupancy stipulation would be applied to land use authorizations, developed recreation sites, special areas, regional forest nutritional study installations, progeny plantation sites, VRM Class I areas, bald eagle and marbled murrelet nest sites, and critical habitat for the snowy plover and Aleutian Canada Goose. The criteria whereby these special stipulations can be waived, modified, or exempted are shown in Appendix II-K of the draft RMP with each stipulation.

Additional conditions may be added as site-specific conditions of approval to protect surface resources found during field visits to proposed well locations.

BLM would provide similar opportunities for geothermal exploration and development in the same areas open to oil and gas leasing. All geothermal activities are regulated under 43 CFR 3200, and leases would be issued subject to the leasing stipulations found in Appendix II-K of the draft RMP.

Areas closed to leasable mineral operations under all alternatives include: wilderness and wilderness study areas, areas withdrawn by other agencies, and congressional withdrawals. For all alternatives, the withdrawals to the Army Corps of Engineers for the Umpqua Jetty and Coos Bay Jetty would be maintained. The BLM does not administer any lands within incorporated cities, which are by law closed to mineral leasing.

Locatable Minerals

Areas not specifically closed from mineral entry would continue to be open under the mining laws. Mineral exploration and development would continue to be regulated under regulations of 43 CFR 3809 to prevent unnecessary or undue degradation. Activities exceeding casual use, but disturbing five acres or less, may proceed 15 days after a notice is filed in the district office. A notice is screened for impacts that constitute unnecessary or undue degradation. Because processing a notice is not a federal action, no formal environmental analysis is required. Projects disturbing more than five acres require an approved plan of operations before work can begin. Once a plan of operations is filed with the BLM, the proposed action is analyzed and mitigating measures needed to prevent unnecessary or undue degradation are required for approval. Plans of operation are bonded to ensure that mitigating measures are followed and that reclamation of the disturbed lands is completed to the satisfaction of the Authorized Officer.

Areas closed to locatable minerals operations, and the operating restrictions from all alternatives are described in Appendix II-K-1 of the draft RMP. All areas subjected to surface disturbance from mining operations, whether conducted under a notice or an approved plan of operations, shall be reclaimed. For all alternatives, the operating restrictions described in Appendix II-K-1 of the draft RMP would be implemented.

Salable Minerals

Salable minerals, including common varieties of sand, gravel, rock, and stone, would be made available for local governments, if the demand exists, consistent with management direction for protection of other resources. BLM would issue sales contracts for mineral materials pursuant to the 43 CFR 3604 or 3610 regulations where disposal is deemed to be in the public interest, while providing for reclamation of mined lands. Mineral material permits are considered on a case-by-case basis and issued at the discretion of the Area Manager. Free Use Permits (FUP) are issued to government agencies or subdivisions and to nonprofit organizations pursuant to 43 CFR 3620. Materials obtained by FUP may not be bartered or sold. Material sale contracts are valued according to the current appraisal of the fair market value. New common use areas or community pits would be designated if the level of local activity warrants.

Rock quarries would also continue to be used to provide rock for use in construction and maintenance of BLM timber access roads. New quarry sites would be developed as needed, subject to consistency with the management direction for protection of other resources, and with the provision for reclamation after the site is depleted of all useable material.

Areas closed to salable mineral activities, and operational restrictions for salable mineral operations by alternative are described in Appendix II-K-2 of the draft RMP. All surface disturbance resulting from salable mineral operations would be reclaimed, to the extent possible. Operational restrictions for salable mineral operations by alternative are described in Appendix II-K-2 of the draft RMP.

Reserved Mineral Estate

The reserved federal mineral estate (also referred to herein as federal subsurface mineral estate) would continue to be open for mineral development.

Conveyances of mineral interest owned by the United States where the surface is, or will be, in non-federal ownership, may be made to the existing or proposed owner of the surface estate after a determination is made under Section 209(b) of FLPMA, finding that there are no known mineral values in the land, or that the reservation of mineral rights in the United States would interfere with or preclude nonmineral development of the land and that such development is a more beneficial use of the land than mineral development.

Under all alternatives, the consolidation of the surface and mineral estates on split estate lands would be pursued through exchange, purchase, or any other authorized means.

Roads

Roads would be constructed and maintained to standards sufficient to serve their anticipated use. Road construction would be sited and scheduled to avoid mass movement and minimize soil erosion. Where appropriate to the anticipated intensity of use, roads would be paved or rocked to minimize sedimentation. Cuts and fills would be revegetated for stabilization prior to winter rains. Roads built for temporary use would be rehabilitated when that use is completed. If required to alleviate significant resource damage, road closures would be implemented using standard analysis, public involvement, and notification procedures.

BLM-administered and private lands generally are intermingled in the planning area, which requires that each party cross the lands of the other in managing their own lands. It is BLM policy to provide all prospective purchasers of BLM timber with an equal opportunity of access when timber is offered for sale. Access is most often accomplished through reciprocal right-of-way agreements with private landowners, through the acquisition of road easements, or through federal ownership and control of roads. Reciprocal right-of-way agreements identify conditions of use that are equitable and nondiscriminatory, and facilitate management of the road network. Most of the lands where logging road right-of-way agreements are appropriate are now covered by reciprocal agreements. The 38 individual agreements and permits, in effect on October 1, 1991, are subject to the regulations in effect when they were executed or assigned.

The provisions of these agreements do not allow the BLM full discretion to control the location of roads constructed under their terms by the private parties across BLM-administered lands (and vice versa). Generally, this limited discretion allows BLM to object for only one environmental reason—excessive soil erosion damage. New reciprocal right-of-way agreements, however, would include a clause requiring compliance with the Endangered Species Act specific to required consultation with the Fish and Wildlife Service. Depending on the results of the consultation, BLM could deny the right to construct a new road.

Noxious Weeds

Treatment of noxious weeds to control infestations on BLM-administered lands would be designed using an integrated pest management approach considering chemical, mechanical and biological methods. Application and monitoring of the effects of herbicides would be done in accordance with BLM's 1986 multi-state EIS, Northwest Area Noxious Weed Control Program, as supplemented in 1987, and its related Record of Decision (ROD). (See Appendix I-B of the Draft RMP for relevant portions of the ROD.) Noxious weeds expected to be subject to control include gorse (*Ulex europaeus*), tansy ragwort (*Senecio jacobea*), scotch broom (*Cytisus scoparius*), purple loosestrife (*Lythrum salicaria*) and Canadian thistle (*Cirsium arvense*). There may be other noxious, troublesome or poisonous plants located on BLM-administered lands which would be considered for treatment. Noxious weed control would primarily be accomplished under contract with the Oregon State Department of Agriculture.

Livestock Grazing

Grazing leases would be issued, based on demand, when grazing does not interfere with timber production, watershed protection, water quality, wildlife habitat, or recreation. In some instances, livestock grazing may be used as a tool to manage habitat for other species such as elk at the Dean Creek Elk Viewing Area and waterfowl in the New River ACEC.

Hazardous Materials

The transportation, storage, and handling of hazardous materials (or any action that poses a substantive present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed) would comply with manufacturers' specifications and applicable laws such as the Resource Conservation and Recovery Act, Emergency Planning and Community Right-to-Know Act, and other environmental laws.

Any release, unauthorized dumping, or abandoned or inactive waste disposal site suspected of involving hazardous wastes would be reported, assessed, and treated according to the District's Hazardous Materials Contingency Plan; Federal Water Pollution Control Act; Clean Air Act; Comprehensive Environmental Response, Compensation and Liability Act; and other applicable state and federal environmental laws.

Fire

Fire management is divided into two categories (Wildfire and Prescribed Fire), each of which is described in more detail in the following sections.

Wildfire

The management of wildfires on BLM-administered lands in the planning area is accomplished through contract with the Oregon Department of Forestry (ODF). ODF has assigned the responsibility for protection of the Coos Bay BLM-administered lands to the Coos Forest Protective Association, Douglas Forest Protective Association, and the Western Lane Forest Protection District. In general, these three agencies conform respectively to the boundaries of Coos and Curry, Douglas, and Lane counties however, Coos Forest Protective Association provides protection of lands in a portion of western Douglas County. The contract covers all presuppression and suppression activities in the planning area.

The suppression of wildfires under all alternatives would involve either an Intensive or Conditional response, depending upon the resource values at risk (see Table 2-4 in Appendix E). Regardless of which of these two response levels is followed, a BLM Environmental Specialist with specific knowledge of resource values, locations and constraints would be assigned to all wildfires that escape initial attack. The Environmental Specialist should also have knowledge of the strategy (plan of action) and tactics (actions to be implemented) to avoid adverse impacts to personnel and resource values. Safety is the first priority in fire strategy.

Intensive fire suppression (e.g., the use of all available fire suppression resources) involves making every reasonable effort to suppress a fire while considering potential resource loss and suppression costs. Intensive fire suppression is normally used in general timber management and rural interface areas where the resource values are high. The main intent in selecting suppression strategy in such high-value resource areas is to keep fires small and contained to the immediate area, and also to prevent the fire from escaping into special fire-concern areas which could require different suppression tactics. Intensive fire suppression includes the use of tractors in fireline construction, air tankers, and snag falling.

Conditional fire suppression represents an unfixed level, or one that could vary based on such factors as the weather, fire behavior, and availability of suppression resources at the time of ignition. With conditional suppression, emphasis is given to using fire control tactics that minimize soil disturbance, including constructing firelines by hand and using water as a suppression method. Tractor use would generally be prohibited in fireline construction; however, in instances where such use may be permitted, tractor use would be subject to specific controls. Air tanker use would be excluded in areas where the potential exists to impact streams. Also, snag falling would be minimized. Typically, a conditional suppression level would be applied in instances where fire suppression equipment would incur more damage to the resources than the fire would cause.

Prescribed Fire

Fire would be used as a tool (prescribed) to accomplish resource objectives for both the general timber management and some special fire-concern areas. As indicated on Table 2-4 in Appendix E, the two approaches for prescribed fire are "Fire Use" and "Fuels Treatment."

Fire Use: Prescribed fire is used in the general timber management areas to prepare lands and enhance conditions for reforestation by removing logging debris through burning, and also retarding competitive brush growth through the intensity of the fire's heat. Another benefit of burning logging debris is the reduction of fire hazards for several years. If not removed, logging debris can jeopardize the investment and future productivity of the site. The removal of too much debris, however, can also impact future productivity of the site.

Fire use is also an important tool in managing for other resource values, as determined on a site-specific basis and with various restrictions (see Table 2-4 in Appendix E).

Fuels Treatment: Management of fuels is important for controlling fire potential. In managing forest lands, this involves the manipulation of the forest fuels (vegetative materials)—either by mechanical or manual methods, or through prescribed fire—to reduce the potential for destroying or damaging resource values. Fuels treatment is an especially important consideration in the rural interface areas where fuels in close proximity to private dwellings pose a fire threat to private lands, in addition to potential for spread to BLM-administered lands. Fuels treatment is also a consideration in managing developed campgrounds and seed production areas where prescribed fire cannot be used without endangering existing investments.

Management Direction for No Action Alternative

This alternative projects all land allocations and management actions in the existing plans into the 1993-2003 decade. Some allocations have changed as a result of land exchanges and acquisitions.

Water Quality and Riparian Areas

Riparian areas (buffers) would be established on both sides of streams. Actual buffer widths would be determined by on-the-ground riparian vegetation, terrain, and stream characteristics. Guidelines are as follows:

> First order stream - No buffer unless stream is used as a domestic water source. Manage as third order if used as a domestic water source.
>
> Second order stream - No buffer unless stream contains fish life or is used as a domestic water source. Manage as third order if exceptions exist.
>
> Third order and larger streams - The following mean width for buffers on each side of streams would be used as guides, with actual widths determined by on-the-ground characteristics:

third order stream	80 feet
fourth order stream	90 feet
fifth order stream	115 feet
sixth order stream	125 feet
seventh order stream	150 feet
eighth order stream	175 feet
ninth order stream	200 feet

First and second order streams that are not buffered would be cleaned of debris to provide a free flowing and stable channel. The aggregate riparian acreage, excluding that within TPCC withdrawn areas, would be approximately 10,800 acres. This land is not available for the management of forest products, but some tree cutting or timber harvest activities could occur to achieve other resource management objectives. Permitted activities would include road construction, establishment of yarding corridors, and fish enhancement projects.

Old-Growth and Mature Forests

Forest lands in the TPCC Limited Management classification and lands allocated for riparian areas, recreation sites, bald eagle protection, and Cherry Creek RNA would not be available for the management of forest products.

(NOTE: The "Limited Management" classification is not used in the current TPCC; however, it is comparable to the current Suitable Woodland classification.)

An additional 25,300 acres of primarily mid-aged and old-growth forest land would also be excluded from planned harvest. These lands would be aggregated in blocks of approximately 640 and 80 acres distributed in a corridor system by seed zone and elevation. Some blocks would incorporate lands not available for the management of forest products as described above.

These forest lands total 41,900 acres, of which 17,000 acres currently are old-growth and 15,200 acres are mature.

Timber

In this alternative, approximately 243,300 acres would be available for the intensive management of forest products, and 4,300 acres for restricted management of forest products. See Table 2-1 for comparisons of acres allocated to the management of forest products.

Special Status Species Habitat

Approximately 100 acres of forest land would be allocated for protection, maintenance, or expansion of bald eagle habitat. Maintenance of habitat for 16 pair of northern spotted owls would be incorporated into the old-growth and mature forest retention areas described above. Snowy plover areas on the North Spit of Coos Bay would be closed, as appropriate for protection during nesting times, from March 15 to September 15. See Table 2-5 in Appendix E for a list of special status species known to exist on BLM-administered lands in the planning area, and their protection by alternative.

Other Wildlife Habitat

During timber sale planning, snags and suitable wildlife trees would be identified for retention in adequate numbers to contribute to maintenance of cavity-nester populations at, or above, the threshold level of 40 percent on lands intensively managed for forest products. Management for cavity-nester populations would be at the 100 percent level on land not available for the management of forest products.

Sensitive areas such as marshes, bogs, and elk calving areas would be protected by maintaining a buffer zone of two times the sight distance (approximately 130 feet) around them.

Designated wildlife areas on the North Spit of Coos Bay would be managed primarily for wildlife benefits.

Special Areas

The New River ACEC and Cherry Creek RNA would be retained. The Powers Environmental Education Area would be managed for educational opportunities. See Table 2-6 in Appendix E for proposed management of existing and potential ACECs and other special areas by alternative.

Recreation

The following existing BLM recreation sites and areas would continue to be managed and maintained for recreation use, some in partnership with other organizations:

- Loon Lake Recreation Area featuring 61 camping units, 34 picnic units, approximately 0.5 miles of trails, a boat ramp, swimming area, and fishing dock on Loon Lake.
- Nine existing recreation sites, (East Shore, Smith River Falls, Vincent Creek, Big Tree, Park Creek, Burnt Mountain Cabin, Bear Creek, Sixes River, and Palmer Butte) featuring 64 camping units, 24 picnic units and 0.5 mile of trail.
- The North Spit Boat Ramp would be managed to provide boating, fishing, and windsurfing access to the north shore of Coos Bay.
- The Dean Creek Elk Viewing Area and New River ACEC would emphasize management and maintenance of watchable wildlife and environmental interpretation programs, and low impact recreational activities. Recreation facilities and activities at New River would be compatible with the goals of the New River ACEC Management Plan.

The following potential recreation sites would be managed in a manner that would provide options for future recreation development:

- Lands on the North Spit of Coos Bay.
- Big Bend on the Smith River Site.
- Fawn Creek Site.

See Table 2-7 in Appendix E for a comparison of management proposals for existing and potential recreation sites, areas, and trails by alternative.

Approximately 6,600 acres and 61 miles of roads would be closed year-round to vehicle use, except for administrative purposes and commercial commodity extraction. Another 109 miles of roads would be signed and voluntarily closed to vehicular access in accordance with the existing road closure plan. See Table 2-1 for comparisons of off-highway vehicle designations and road closures.

Wild and Scenic Rivers

No rivers would be managed as components of the Wild and Scenic River System.

Visual Resources

Lands within existing boundaries designated by Congress for exclusive management (Squaw Island Wilderness and Cherry Creek RNA) and the North Sisters Rocks and Zwagg Island Wilderness Study Areas would be managed as VRM Class I. Approximately 4,300 acres would be managed as VRM Class II, and are primarily in corridors adjacent to federal and state highways. Forest lands within these corridors would be available for restricted management of forest products. Lands classified for wildlife and recreational areas on the North Spit of Coos Bay (approximately 1,000 acres) would be managed as VRM Class III. All other district land would be managed as VRM Class IV. See Table 2-1 for acres of each class.

Land Tenure

Exchanges that would consolidate BLM-administered lands would be considered. Approximately 7,200 acres of primarily small (less than 160 acres) scattered parcels of BLM-administered land would be identified as available for potential exchange.

Additionally, BLM-administered lands on the North Spit of Coos Bay within Coos County Comprehensive Plan zoning district 3E-WD (water-dependent development) and portions of 4CS (conservation shorelands) and 6WD, could be offered for exchange to accommodate industrial development, after specific industrial projects were proposed, and it was determined that environmental impacts could be mitigated.

Sale of district-administered lands that meet the criteria of FLPMA Section 203(a) would be considered on a case-by-case basis.

Energy and Minerals

Leasable minerals (oil and gas, and geothermal resources) would be available on almost all land where the mineral estate is administered by BLM. Most lands would also remain open to location under the mining laws and to sale of salable minerals. See Tables 2-8, 2-9 and 2-10 in Appendix E for comparison of mineral restrictions.

Rural Interface Areas

No special management, other than protection of domestic water sources, would be provided in rural interface areas.

Management Direction Alternative A

Water Quality and Riparian Areas

Riparian Management Areas (RMAs) would be established averaging 75 feet in width on each side of perennial (generally third order and larger) streams and other waters (i.e., lakes). Actual RMA widths would be determined by on-the-ground riparian vegetation, terrain, and stream characteristics.

Old-Growth and Mature Forests

Forest lands in the TPCC category of Nonsuitable Woodland would not be subject to planned harvest (i.e., not included in the acreage used to determine the ASQ). Also excluded from planned harvest would be other forest lands allocated for riparian-zone protection in RMAs, recreation sites, threatened and endangered species recovery areas, and Cherry Creek RNA. These forest lands total 43,900 acres, of which 12,900 acres currently are old growth and 12,600 acres are mature forest.

Timber

Approximately 265,200 acres would be available for the intensive management of forest products. See Table 2-1 for comparisons of acres allocated to the management of forest products.

Special Status Species Habitat

BLM management and permitting actions would be designed to protect habitat of federal candidate (Category 1 and 2), state listed, and Bureau sensitive species where such protection would not diminish commercial use such as timber production. See Table 2-5 in Appendix E for a list of special status species known to exist on BLM-administered lands in the planning area, and their protection by alternative.

Special Areas

The New River ACEC and Cherry Creek RNA would be retained, and the Cherry Creek RNA would also be designated as an RNA/ACEC. See Table 2-6 in Appendix E for proposed management of existing and potential ACECs and other special areas.

Recreation

The following existing BLM recreation sites and areas would continue to be managed and maintained for recreation use by BLM, some in partnership with other organizations:

- The Loon Lake/East Shore recreation area would be designated as an SRMA.

- The Dean Creek Elk Viewing Area and New River ACEC would be designated as SRMAs, emphasizing management and maintenance of watchable wildlife and environmental interpretation programs, and low impact recreational activities. Recreation facilities and activities at New River would be compatible with the basic goals of the New River ACEC Management Plan.

- The Bear Creek and Sixes River recreation sites would be managed and maintained for day use and overnight recreational use.

- The North Spit Boat Ramp would be managed to provide boating, fishing, and windsurfing access to the north shore of Coos Bay.
- Six low-use recreation sites (Smith River Falls, Vincent Creek, Park Creek, Big Tree, Burnt Mountain Cabin, and Palmer Butte) would be closed. Existing facilities would be removed and maintenance operations would not occur. These sites would be available for undeveloped recreational use while retaining their natural settings.

See Table 2-7 in Appendix E for a comparison of management proposals for existing and potential recreation sites, areas, and trails by alternative.

Off-highway vehicle use and motorized access would be limited to existing roads (approximately 1,565 miles) and trails. Approximately 2,400 acres would be closed year-round to vehicle use except for administrative use and commercial commodity extraction.

Wild and Scenic Rivers

No rivers would be found suitable for designation as wild, scenic, or recreational.

Visual Resources

Lands within existing boundaries designated by Congress for exclusive management (Squaw Island Wilderness and Cherry Creek RNA) and the North Sisters Rocks and Zwagg Island Wilderness Study Areas would be managed as VRM Class I. Forest lands available for intensive management of forest products would be managed as VRM Class IV, and the remaining lands would be managed as inventoried. See Table 2-1 for acres of each VRM class by alternative.

Land Tenure

Exchanges would be made to acquire lands for enhancement of the nondeclining harvest level of the commercial forest land managed by BLM. Such exchanges would focus on improving age class distribution or other harvest level determination factors. Factors that would be considered include site quality, access to public forest land, logical logging units, and management of public forest land to facilitate timber harvest. No exchanges would be made to acquire lands more valuable for nontimber uses. No commercial timberland would be sold or leased. No leases or conveyance of commercial timberland would be made under the Recreation and Public Purposes Act.

Preliminary discussions have been held with several timber companies to determine interest in land exchanges meeting the objectives listed above. To date, a total of 30,400 acres of BLM-administered land have been identified as lands potentially available for exchange for 51,200 acres of private lands. These acreages do not constitute final exchange acres, but rather a pool of lands from which acreage could be selected to achieve an equalization of values based on site-specific evaluations.

BLM-administered lands located on the North Spit of Coos Bay within Coos County Comprehensive Plan zoning districts 3E-WD, 4CS, and 6WD could be offered for sale, exchange, or lease to accommodate local needs for economic expansion and industrial development. Lands to be acquired would be forested lands.

Energy and Minerals

Leasable minerals (oil and gas, and geothermal resources) would continue to be made available on almost all land where the mineral estate is administered by BLM. Most lands would also remain open to location under the mining laws and to sale of salable minerals.

See Tables 2-9, 2-10 and 2-11 in Appendix E for comparison of mineral restrictions by alternative.

Rural Interface Areas

No special management would be provided in rural interface areas.

Management Direction Alternative B

Water Quality and Riparian Areas

RMAs would be established using the following guidelines for average widths on each side of perennial streams and other waters:

third order streams	75 feet
fourth order streams	100 feet
fifth order streams	140 feet
sixth order and larger streams	160 feet
other waters (such as lakes)	100 feet

RMAs would also be established on approximately 205 miles of second order streams to protect anadromous fish habitat and domestic water sources. Actual RMA widths would be determined by on-the-ground riparian vegetation, terrain, and stream characteristics.

Old-Growth and Mature Forests

Forest lands in the TPCC categories of Nonsuitable Woodland and Suitable Woodland-Low Site would not be subject to planned harvest. Also excluded from planned harvest would be other forest lands allocated for riparian-zone protection in RMAs, recreation sites, threatened and endangered species recovery areas where timber harvest is prohibited, and ACECs. These forest lands total 47,900 acres, of which 13,700 acres currently are old growth and 13,400 acres are mature forest that would not be available for the management of forest products.

An additional 18,600 acres of forest land would be excluded from planned harvest to contribute to habitat diversity. These lands would be aggregated in blocks of approximately 640 and 80 acres distributed in a corridor system by seed zone and elevation as shown on the Alternative B Map, included in the Draft RMP. Some blocks incorporate lands excluded from harvest for other purposes as noted in the preceding paragraph. Emphasis on inclusion of Public Domain (PD) lands led to the inclusion of 4,900 acres of such lands in the blocks.

Timber

Approximately 241,800 acres would be available for intensive management, and 600 acres available for restricted management of timber products. See Table 2-1.

Special Status Species Habitat

BLM management and BLM-permitted activities would be constrained or modified to the extent considered necessary to prevent federal listing of federal candidate (Category 1 and 2) species known to occur only on BLM-administered lands. BLM management and permitting actions would also be designed to protect habitats of federal candidate (Category 1 and 2), state listed, and Bureau sensitive species on O&C and CBWR lands where such actions would not diminish commercial use such as timber production, and also to protect habitats of all such species on PD lands. If any of the cited species are suspected to be present on PD land in an area proposed for a specific site-disturbing activity, field surveys would focus on those species. See Table 2-5 in Appendix E for a list of special status species and their protection by alternative.

Other Wildlife Habitat

During timber sale planning, suitable wildlife trees would be identified for retention in numbers adequate to retain, where available, at least three snags and green culls (nonmerchantable) per acre.

Special Areas

The New River ACEC and Cherry Creek RNA would be retained. Cherry Creek RNA would also be designated as an RNA/ACEC. Two additional areas located on PD land (North Fork Hunter Creek and Hunter Creek Bog) would be designated as RNA/ACECs, and North Spit would be designated as an ACEC. A portion of the China Wall, located on non-commercial forest land, would also be designated as an ACEC. See Table 2-6 in Appendix E.

Recreation

The following existing BLM recreation sites and areas would continue to be managed and maintained for recreation use by BLM, some in partnership with other organizations:

- The Loon Lake/East Shore area would be designated as an SRMA.
- The Dean Creek Elk Viewing Area and New River ACEC would be designated as SRMAs with emphasis on management and maintenance of watchable wildlife and environmental interpretation programs, and low impact recreational activities. Recreation facilities and activities at New River would be compatible with the goals of the New River ACEC Management Plan.
- Seven existing recreation sites (Smith River Falls, Vincent Creek, Park Creek, Big Tree, Bear Creek, Sixes River, and Palmer Butte)

recreation sites would be maintained and managed for day use and overnight recreational use.

- The North Spit Boat Ramp would be managed to provide boating, fishing, and windsurfing access to the north shore of Coos Bay.

In addition to the existing developed areas and sites, two new Special Recreation Management Areas (SRMAs) would be established and managed on PD lands for recreation use and development as follows:

- Coos Bay Shorelands, featuring two areas - the North Spit of Coos Bay and Coos Head. Both areas currently provide opportunities for sightseeing, whale watching, storm watching and photography, among other undeveloped recreational uses. In addition, the North Spit area provides opportunities for wildlife observation, fishing, crabbing, clam digging, camping, windsurfing, boating, horseback riding, hiking, OHV use, and other dispersed activities.
- Gregory Point, featuring an interagency cultural heritage interpretative center with potential public access to the Cape Arago Lighthouse. This site provides a rich array of cultural, historic, scenic, and biological values suitable for cultural and natural history interpretation/education, Native American cultural appreciation, nature studies, photography, and wildlife observation.

The following potential recreation sites would be managed for recreational use and development, or in a manner that would provide options for future recreation development:

- Umpqua Lighthouse
- Lower Four Mile day-use area (New River)
- Sixes River boat ramp
- North Fork Hunter Creek trail
- Hunter Creek Bog trail
- Bear Creek/Panther Ridge trail

See Table 2-7 in Appendix E for a comparison of management proposals for existing and potential recreation sites, areas, and trails.

Off-highway vehicle use and motorized access would be limited to existing roads and trails. Approximately 4,700 acres would be closed year-round to vehicle use except for administrative purposes and commercial commodity extraction. See Table 2-1 for comparisons of off-highway vehicle designations and road closures.

Wild and Scenic Rivers

No rivers would be found suitable for designation as wild, scenic or recreational.

Visual Resources

Lands within existing boundaries designated by Congress for exclusive management (Squaw Island Wilderness and Cherry Creek RNA) and the North Sisters Rocks and Zwagg Island Wilderness Study Areas would be managed as VRM Class I.

Forest lands available for intensive management of forest products within 0.25 mile of designated recreation sites, state and federal highways, and state scenic waterways would be managed as inventoried by VRM class. These forest lands would be available for the restricted management of forest products. All other available forest land would be managed as VRM Class IV, except as noted under Rural Interface Area Management. The remaining lands (Non-forest, Nonsuitable Woodland, Suitable Woodland-Low Site, and lands allocated for uses other than timber production) would be managed as inventoried. The spatial pattern of PD land does not facilitate different management prescriptions for these lands. See Table 2-1 for acres of each VRM class by alternative.

Land Tenure

Exchanges of O&C and CBWR lands would be made primarily to acquire lands which would enhance timber management opportunities. Exchanges of PD lands would be made to benefit one or more of the resources managed, including nontimber values. Sale of O&C and CBWR lands other than available commercial forest lands and PD lands, would be made to dispose of lands that meet any of the criteria of FLPMA Section 203(a). Leases of PD lands would be made to accommodate other uses. Leases or conveyances under the Recreation and Public Purposes Act would be made in Zones 2 and 3 (described in Land Tenure Under Management Direction Common to all Alternatives) to provide appropriate facilities or services.

BLM-administered lands on the North Spit of Coos Bay within Coos County Comprehensive Plan zoning districts 3E-WD, 4CS, and 6WD could be offered for exchange or lease to accommodate local economic expansion and industrial development. BLM would acquire lands in zoning district 2CS to benefit recreation and wildlife values, and in zoning district 5A-NS (natural shorelands) to benefit wildlife values.

Energy and Minerals

Leasable minerals (oil and gas, geothermal resources) would continue to be made available on almost all land where the mineral estate is administered by BLM. Most lands would also remain open to location under the mining laws and to sale of salable minerals.

See Tables 2-8, 2-9 and 2-10 in Appendix E for comparison of mineral restrictions by alternative.

Rural Interface Areas

Approximately 2,100 acres of BLM-administered lands within 0.25 mile of private land in identified rural interface areas (zoned for 1-acre to 5-acre lots) would be managed for VRM Class III objectives. Timber management practices within these rural interface areas would be restricted, where feasible and consistent with sustained yield timber management as follows:

- Hand application rather than aerial application of herbicides and pesticides.
- Inclusion of additional buffers for domestic water sources.
- Hand piling of slash for burning as opposed to broadcast burning.

See Table 2-11 in Appendix E for comparison of identified rural interface areas and related BLM management zones by alternative.

Management Direction Alternative C

Water Quality and Riparian Areas

RMAs would be established with the following guidelines for average widths on each side of perennial streams and other waters:

third order streams	105 feet
fourth order streams	150 feet
fifth order streams	210 feet
sixth order and larger streams	240 feet
other waters (such as lakes)	150 feet

RMAs would also be established on approximately 205 miles of second order streams to protect anadromous fisheries and domestic water sources. Actual RMA widths would be determined by on-the-ground riparian vegetation, terrain, and stream characteristics.

Old-Growth and Mature Forests

Forest lands in the TPCC categories of Nonsuitable Woodland, Suitable Woodland-Low Site, and Suitable Woodland-Nonsuitable Commercial Forest Land would not be subject to planned harvest. Also not available for the management of forest products would be other forest lands allocated for riparian-zone protection in RMAs, recreation sites, ACECs, and threatened and endangered species recovery areas where timber harvest is prohibited. These forest lands total 58,300 acres, of which 16,400 acres currently are old-growth and 16,000 acres are mature forest.

An additional 38,100 acres of forest land would be included and maintained in a system of old-growth restoration and retention (R&R) areas to retain and improve biological diversity. Individual R&R areas would be between 600 and 2,500 acres each as shown on the Alternative C Map, included in the Draft RMP. Of this land, 10,800 acres are currently old growth and 8,800 acres are mature forest. All but 172 miles of arterial or collector roads within these areas would be closed to public use.

The remaining 212,500 acres of forest land would be managed under partial stand retention prescriptions (See Timber Management). Lands to be managed for a high level of partial retention would be considered potential replacements for old-growth R&R areas lost to natural events.

Stands to be managed for a high level of partial retention, and most of the old-growth R&R areas, would be located within biological connectivity corridors designed to provide linkage between major reserved lands on the Siuslaw and Siskiyou National Forests, and the Roseburg, Eugene, and Medford BLM districts.

Agreements would be pursued with private landowners and other land management agencies to optimize the extent and distribution of old-growth R&R areas while minimizing undue impact on multiple resource use.

Timber

Approximately 212,500 acres would be available for restricted management of forest products. See Table 2-1.

Regeneration harvests would be used to regenerate all indigenous tree species. This would be achieved through partial cutting, group selection (small clearcuts), clearcutting, or a combination of these. Regeneration harvest of predominantly conifer stands would be conducted under one of two broad prescription concepts, except where uneven-age management is most appropriate for the stand (either for silvicultural reasons and/or to address another planning issue).

On approximately 87,900 acres, the regeneration harvest prescription would be designed to retain 40 percent of the normal live conifer basal area for the harvested site. These lands would be situated in biological connectivity corridors identified through an interdisciplinary process, in analytical watersheds where federal lands are less than 25 percent of the forest land, and on lands within one to two miles of old-growth R&R areas (See Old Growth and Mature Forests). Figure 2-3 illustrates an example of this pattern.

Clearcutting would be the primary regeneration harvest system used within the Douglas-fir/red alder/salmonberry major plant grouping; however, individual trees or groups of trees would be retained within the unit boundaries to meet the 40 percent basal area objective. The size of openings would generally be 10 acres or less. Partial cutting, group selection, or modified clearcut harvest systems would be more commonly used in areas south of Highway 42 (the madrone-tanoak major plant group), the Douglas-fir/red alder/vine maple major plant grouping, at higher elevations, and in the eastern portion of the district (the Douglas-fir/brush/salal major plant grouping).

On 124,600 acres available for timber production not described above, the regeneration harvest prescription would retain an average of 17.5 percent of the normal live conifer basal area for the harvested site. Reserved trees would be in a distributed clumped, or single tree pattern. Dominant and codominant trees to be reserved would vary in size but would include some of the larger trees in the stand. (For a typical site on the district, 17.5 percent of normal basal area would result in the retention of approximately 15 to 18 trees per acre at age 150.)

Regeneration harvest rotations would reflect the desired future condition of the stands (reestablishment of old-growth conditions and maintenance of those conditions in a stand for approximately 30 years before regeneration harvest) expected to occur at an average age of 150 years in the long term. A small amount of regeneration harvesting could occur in younger stands (less than age classes 40 and 50) within the next decade.

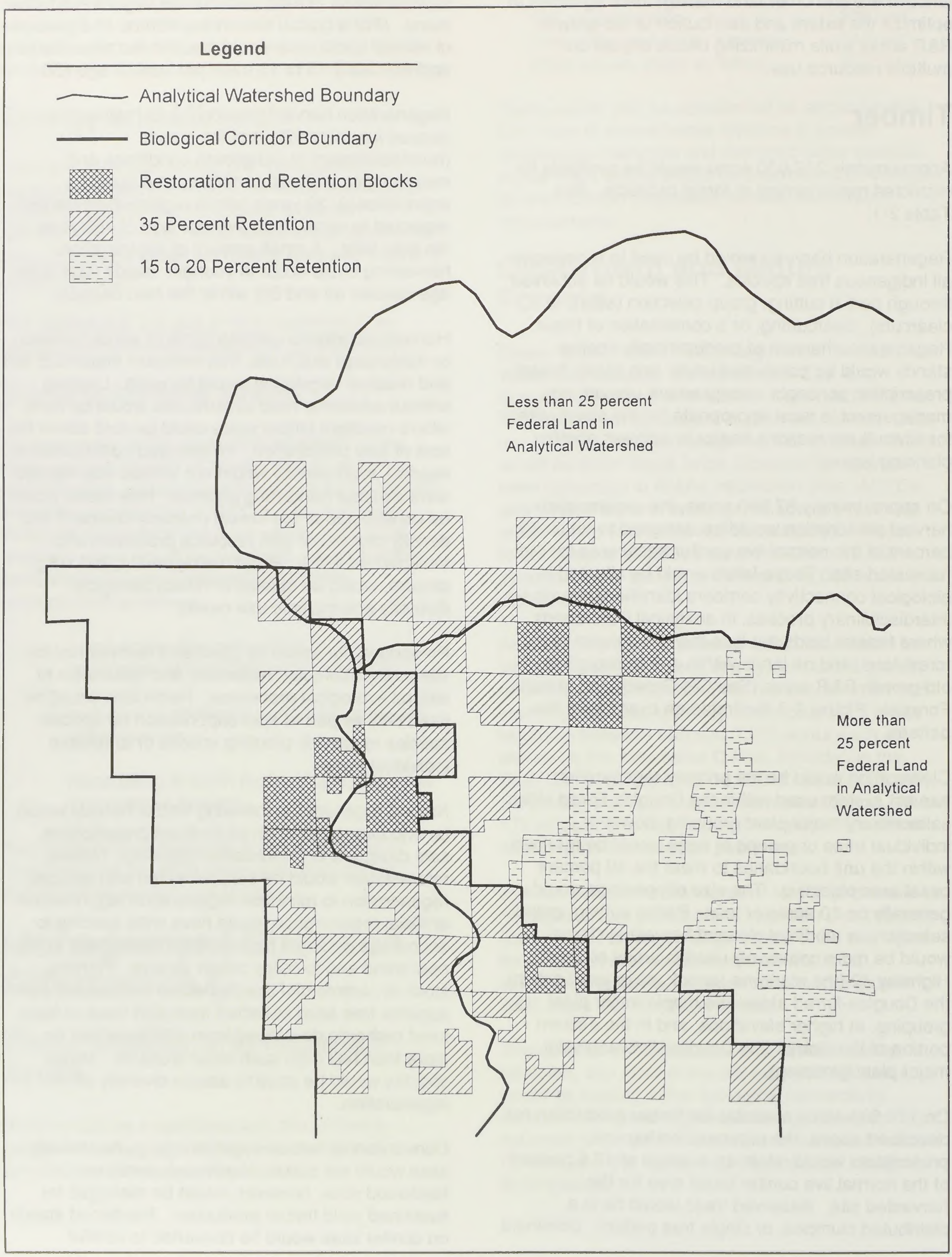
Harvest techniques utilizing cable or aerial systems, or designated skid trails, that minimize impacts to soil and residual vegetation would be used. Logging without additional road construction would be done where resultant timber sales could be sold above the cost of sale preparation. Where road construction is needed, road density would not exceed that needed were clearcut harvesting planned. New roads would be constructed to the lowest practical standard and density consistent with resource protection and multiple use value. Road management, including closure, would be applied to reflect biological diversity and multiple use needs.

Prescribed fire would be used as a favored tool for site preparation, fuel reduction, and restoration of natural ecological processes. Herbicides would be used only as part of spot suppression for specific species to provide planting spaces or to release individual trees.

Natural regeneration following timber harvest would be encouraged through silvicultural prescriptions, sale design, and reforestation planning. Natural reforestation would be supplemented with artificial regeneration to minimize regeneration lag; however artificial regeneration would have wide spacing to encourage a natural regeneration component in the new stand and to delay crown closure. Planting stock of commercial species would be selected from superior tree seed collected from wild trees or from seed orchards developed from wild trees, but no more than half from such seed orchards. Mixed species would be used to assure diversity of regeneration.

Conversion of natural vegetation (e.g., hardwood) sites would not occur. Hardwood stands on hardwood sites, however, would be managed for sustained yield timber production. Hardwood stands on conifer sites would be converted to conifer

Figure 2-3. Alternative C Design Illustration


Legend
Analytical Watershed Boundary
Biological Corridor Boundary
Restoration and Retention Blocks
35 Percent Retention
15 to 20 Percent Retention
Less than 25 percent Federal Land in Analytical Watershed
More than 25 percent Federal Land in Analytical Watershed

production, with the prescription to include retention of some hardwoods in the re-established stand.

In conifer stand management, native hardwoods would be retained or restored as part of the forest mix to enhance biological diversity, provide natural fertilization, and aid in forest protection from wildfire. Hardwoods would be artificially regenerated where natural propagation is not likely. The goal would be to retain or attain a hardwood component resembling or exceeding the level occurring before logging to emphasize retention of species that have significant ecological roles.

Fertilization would be used where needed to supplement natural nitrogen fixation, enhance growth, and hasten development of structure and large trees.

On approximately 90 percent of the forest land, precommercial and commercial thinning would be part of density management. These intermediate cuttings would occur on lands available for timber production, as well as on lands in old-growth R&R areas which do not possess old-growth characteristics. The objective would be to maintain open canopy conditions and promote retention of mixed species, as well as accelerate development of old-growth structure conditions. To the extent that stand conditions permit, intermediate harvests would leave enough snags and dead and down material to meet Old-Growth Definition Task Group standards (see glossary).

Special Status Species Habitat

No activities would be undertaken or permitted that would jeopardize populations of federally-listed threatened or endangered plants or animals, or species officially proposed for such listing.

In addition to protecting federally-listed or proposed threatened or endangered species, management of areas maintained to conserve biological diversity would focus on protection of federal candidate (Category 1 and 2), state listed, and Bureau sensitive species. BLM management and BLM-permitted activities would be constrained or modified to the extent considered necessary to prevent listing of federal candidate (Category 1 and 2) species known only to occur on BLM-administered lands. BLM management and permitting actions would also be designed to protect habitats of federal candidate (Category 1 and 2), state listed, and Bureau sensitive plant and animal species on other O&C and CBWR lands where mitigation would not diminish commercial use such as timber production from land allocated to such use. Such habitat would also be protected on all PD lands.

Field surveys would focus on any cited species suspected to be present on PD land in an area proposed for a specific site-disturbing activity. If such species are identified on PD lands, their habitat would be protected. See Table 2-5 in Appendix E for a list of special status species and their protection by alternative.

Other Wildlife Habitat

Timber harvests would be designed to retain, where available, enough snags and dead and down material to meet Old-Growth Definition Task Group standards, which vary according to plant-community series. For Douglas-fir stands on western hemlock sites (western hemlock series), the minimum standards are four conifer snags per acre, measuring at least 20 inches dbh and 15 feet tall; 15 tons of down logs per acre including four pieces per acre, measuring at least 24 inches in diameter and 50 feet in length; or what currently exists in natural stands on the district.

Special habitats, when considered to be significant by IDT review, would be buffered by 100 feet from surface disturbance and harvest of timber.

Special Areas

The New River ACEC, Cherry Creek RNA, and Powers Environmental Education Area would be retained. Cherry Creek RNA would also be designated as an RNA/ACEC. Four additional areas (Wassen Creek, North Fork Hunter Creek, Hunter Creek Bog, and the North Fork Chetco River) would be designated as RNA/ACECs. North Spit and China Wall would be designated as ACECs. See Table 2-6 in Appendix E.

Recreation

The following existing BLM recreation sites and areas would continue to be managed and maintained for recreation use by BLM, some in partnership with other organizations:

- The Loon Lake/East Shore area would be designated as an SRMA.
- The Dean Creek Elk Viewing Area and New River ACEC would be designated as SRMAs

with emphasis on management and maintenance of the watchable wildlife and environmental interpretation programs, and low impact recreational activities. Recreation facilities and activities at New River would be compatible with the basic goals of the New River ACEC Management Plan.

- Eight existing (Smith River Falls, Vincent Creek, Park Creek, Big Tree, Burnt Mountain Cabin, Bear Creek, Sixes River, and Palmer Butte) recreation sites would continue to be maintained and managed for day use and overnight recreation use.

- The North Spit Boat Ramp would be managed to provide boating, fishing, and windsurfing access to the north shore of Coos Bay.

In addition to the existing developed areas and sites, two new Special Recreation Management Areas (SRMAs) would be established and managed for recreational use and development as follows:

- Coos Bay Shorelands, featuring two areas—the North Spit of Coos Bay and Coos Head. Both areas currently provide opportunities for sightseeing, whale watching, storm watching and photography among other undeveloped recreational uses. In addition, the North Spit area provides opportunities for wildlife observation, fishing, crabbing, clam digging, camping, windsurfing, boating, horseback riding, hiking, limited OHV use, and other dispersed activities.

- Gregory Point, featuring an interagency cultural heritage interpretative center with potential public access to the Cape Arago Lighthouse. This site provides a rich array of cultural, historic, scenic, and biological values suitable for cultural and natural history interpretation/education, Native American cultural appreciation, nature studies, photography, and wildlife observation.

In addition, 16 potential recreation sites would be managed for recreational use and development, or in a manner that would provide options for future recreational development. No timber sales other than salvage sales of dead and dying timber would be made in these areas during the period of the plan. An exception would be made in the event a natural catastrophe (e.g., fire, windstorm) destroyed the high value recreation potential of the area.

See Table 2-7 in Appendix E for a comparison of management proposals for existing and potential recreation sites, areas, and trails.

Several Back Country Roads would be designated and managed, as follows:

- Approximately 57 miles of the Smith River Road (BLM and Douglas County).

- 7 miles of the BLM South Sisters and East and West Oxbow roads.

- 28 miles of BLM and Douglas County roads between Mill Creek on Highway 38 to Tyee on the Umpqua River.

- 63 miles of the Coos Bay Wagon Road and the Myrtle Point to Sitkum roads.

Back Country Roads is a component of the National Scenic Byway System. Other roads would be considered for addition to the system on a case-by-case basis as the need or opportunity arises.

Off-highway vehicle use and motorized access would be limited to designated roads and trails throughout most of the district. A goal of two (2) miles of open road per section (square mile) would be implemented wherever possible on BLM-managed lands. Accordingly, approximately 1,040 miles of road would be designated as open and 525 miles as closed to vehicle use. In addition, approximately 8,400 acres (see Management Guidance Common to All Alternatives for list of areas) would be designated as closed year-round to vehicle use except for administrative purposes or commercial commodity extraction. See Table 2-1 for a comparison of off-highway vehicle designations and road closures by alternative.

Wild and Scenic Rivers

The 9.5 river miles of New River from the outlet of Floras Lake to its mouth at the Pacific Ocean would be found suitable for designation as Scenic. See Table 2-12 in Appendix E for comparisons of proposed wild and scenic river suitability findings.

Visual Resources

Lands within existing boundaries designated by Congress for exclusive management (Squaw Island Wilderness and Cherry Creek RNA), and the North Sisters Rocks and Zwagg Island Wilderness Study Areas, would be managed as VRM Class I.

Forest lands available for intensive management of forest products where federal ownership consists of more than half of a viewshed, and available forest land adjacent to (within 0.25 mile) designated recreation sites, state and federal highways, and proposed Wild and Scenic Rivers would be managed as inventoried. All other available forest land would be managed as VRM Class IV, except as noted for rural interface areas. The remaining lands would be managed as inventoried. Table 2-1 shows the acres that would be managed under each VRM class by alternative.

Land Tenure

Exchanges of PD lands would be made to benefit one or more of the resources managed, including nontimber values. Exchanges of O&C and CBWR lands would emphasize opportunities that would contribute to conservation of biological diversity or would enhance timber management opportunities. Sale of O&C and CBWR lands (other than available commercial forest lands) and of PD lands would be made to dispose of lands that meet any of the criteria of FLPMA Section 203(a). Leases of such lands would be made to accommodate other appropriate uses. Leases or conveyances under the Recreation and Public Purposes Act would be made in Zones 2 and 3 to provide appropriate facilities or services.

BLM-administered lands on the North Spit of Coos Bay within Coos County Comprehensive Plan zoning districts 3E-WD, 4CS, and 6WD could be offered for exchange or lease to accommodate local economic expansion and industrial development. BLM would acquire lands in zoning district 2CS to benefit recreation and wildlife, and in zoning district 5A-NS to benefit wildlife values.

Energy and Minerals

Leasable minerals (oil and gas, geothermal resources) would continue to be made available on almost all land where the mineral estate is administered by BLM. Most lands would also remain open to location under the mining laws and to sale of salable minerals.

See Tables 2-8, 2-9, and 2-10 in Appendix E for comparison of mineral restrictions by alternative.

Rural Interface Areas

Approximately 2,100 acres of BLM-administered lands within 0.25 mile of private land in identified rural interface areas (zoned for 1-acre to 20-acre lots) would be managed for VRM Class III objectives. Retention of basal area as described in the Timber section would result in meeting VRM Class III objectives.

Timber management practices within these rural interface areas would be restricted, where feasible and consistent with sustained yield timber management, as follows:

- Hand application rather than aerial application of herbicides and pesticides.
- Inclusion of additional buffers for domestic water sources.
- Hand-piling slash for burning as opposed to broadcast burning.

See Table 2-11 in Appendix E for comparison of identified Rural Interface Areas and related BLM management zones by alternative.

Management Direction Alternative D

Water Quality and Riparian Areas

RMAs would be established with the following average widths on each side of streams and other waters:

second order streams	60 feet
third order streams	140 feet
fourth order streams	200 feet
fifth order streams	280 feet
sixth order and larger streams	320 feet
other water such as lakes	200 feet

Actual RMA widths would be determined by on-the-ground vegetation, terrain, and stream characteristics. No timber harvest would be planned within these RMAs, but some tree cutting or timber harvest activities could occur to achieve resource management objectives. Permitted activities may include road construction and yarding corridors to facilitate timber harvest outside the RMA, as well as wildlife and fish habitat improvement projects. All logging, burning, road construction and maintenance, and silvicultural practices would be designed to prevent degradation of water quality.

Old-Growth and Mature Forests

Forest lands in the TPCC categories of Nonsuitable Woodland and Suitable Woodland would not be subject to planned harvest. Also not available for the management of forest products would be other forest lands allocated for riparian-zone protection in RMAs, recreation sites, ACECs, and other land needed to allow undisturbed protection of special status species. These forest lands total 73,300 acres, of which 18,900 acres currently are old-growth and 19,400 acres are mature forest.

An additional 75,500 acres of forest land would be set aside from timber harvest and new road construction for BLM management according to recommendations of the Interagency Scientific Committee's Conservation Strategy for the Northern Spotted Owl. Of this land, 20,300 acres are currently old growth and 15,400 acres are mature forest.

Timber

Approximately 160,100 acres would be available for restricted timber management. The 50-11-40 rule (see special status species habitat) would restrict management on 153,400 acres, and rural interface areas would restrict management on 6,700 acres. See Table 2-1.

Special Status Species Habitat

No activities would be undertaken or permitted that would jeopardize populations of federally-listed threatened or endangered plants or animals, or species officially proposed for such listing.

In addition to protecting federally-listed and proposed threatened or endangered species, BLM management and permitting actions would also be designed to protect habitats of federal candidate (Category 1 and 2), state listed, and Bureau sensitive species. Field surveys would focus on any of these species suspected to be present in an area proposed for a specific site-disturbing activity. If such species are identified, their habitat would be protected. See Table 2-5 in Appendix E for a list of special status species and their protection by alternative.

Spotted owl habitat conservation areas (HCAs) would be established as shown on the Alternative D Map, included in the Draft RMP. Timber harvest would not be planned in these areas, and logging and other silvicultural activities (except stand regeneration) would not be conducted. Road construction in HCAs would take place only where no feasible alternative exists. Any roads constructed in HCAs would be located and engineered to minimize loss and alteration of spotted owl habitat; no roads would be located within 0.25 mile of the activity center of any spotted owl pair. Reforestation activities on cutover lands in HCAs would encourage a mix of species in the regenerating forest. In each quarter township, lands would be managed so that 50 percent of the forest matrix on BLM-administered land outside HCAs would have stands averaging 11 inches or more in dbh with at least 40 percent canopy closure (50-11-40 rule).

During timber sale planning, suitable wildlife trees would be identified for retention. The target would be to retain all soft snags consistent with safety standards, three hard snags per acre (larger than 20 inches dbh and 10 feet tall), and two green trees (larger than 20 inches dbh) per acre.

Where available, a total of 350 linear feet of down logs per acre would be retained in final harvest timber sale units. These would include all Class 1 logs that are hollow or rotten, and Class 2 and 3 logs greater than 20 inches in diameter (see glossary). Smaller material would be left on site unless removal is needed for tree planting.

Special habitats, considered to be significant by IDT review, would be buffered by 100 to 200 feet from surface disturbance and harvest of timber.

Special Areas

The New River ACEC, Cherry Creek RNA, and Powers Environmental Education Area would be retained. Cherry Creek RNA would also be designated as an RNA/ACEC. Five additional areas (Wassen Creek, Upper Rock Creek, North Fork Hunter Creek, Hunter Creek Bog, and North Fork Chetco River) would be designated as RNA/ACECs. Four additional areas (North Spit, China Wall, North Fork Coquille River, and Tioga Creek) would be designated as ACECs.

In addition, the boundary of the proposed China Wall ACEC would be extended to ridge lines to provide a more manageable area. See Table 2-6 in Appendix E.

Recreation

The following existing BLM recreation sites and areas would continue to be managed and maintained for recreation use by BLM, some in partnership with other organizations:

- The Loon Lake/East Shore area would be designated as an SRMA.

- The Dean Creek Elk Viewing Area and New River ACEC would be designated as SRMAs with emphasis on management and maintenance of the watchable wildlife and environmental interpretation programs, and low impact recreational activities. Recreation facilities and activities at New River would be compatible with the basic goals of the New River ACEC Management Plan.

- Seven existing (Vincent Creek, Smith River Falls, Park Creek, Big Tree, Burnt Mountain Cabin, Bear Creek, and Palmer Butte) recreation sites and trails would continue to be maintained and managed for day use and overnight recreation use.

- The North Spit Boat Ramp would be managed to provide boating, fishing and wind surfing access to the north shore of Coos Bay.

In addition to the existing developed areas and sites, three new SRMAs would be established and managed for recreational use and development as follows:

- Coos Bay Shorelands, featuring two areas—the North Spit of Coos Bay and Coos Head. Both areas currently provide opportunities for sightseeing, whale watching, storm watching, and photography among other undeveloped recreational uses. In addition, the North Spit area provides opportunities for wildlife observation, fishing, crabbing, clam digging, camping, windsurfing, boating, horseback riding, hiking, OHV use and other dispersed activities.

- Gregory Point, featuring an interagency cultural heritage interpretative center with potential public access to the Cape Arago Lighthouse. This site provides a rich array of cultural, historic, scenic, and biological values suitable for cultural and natural history interpretation/education, Native American cultural appreciation, nature studies, photography, and wildlife observation.

- Sixes River, featuring camping, picnicking, swimming, fishing, floating, hiking and recreational gold panning and dredging. Recreation development opportunities include trails, historical site interpretation, construction of two boat ramps, and improving existing facilities.

In addition, 32 potential recreation sites would be managed for recreation use and development, or in a manner that would provide options for future recreational development. No timber sales other than salvage sales of dead and dying timber would be made during the life of the plan. An exception would be made if a natural catastrophe (e.g., fire, windstorm) destroyed the high value recreation potential of the areas.

Additionally, the district would attempt to acquire lands or an easement for public access to lands adjacent to the Loon Lake SRMA to permit expansion of existing facilities and development of trails. The district would also attempt to acquire South Sisters Rock to provide access for day-use recreation at this site, including picnicking, wildlife viewing, nature study, and photography.

See Table 2-7 in Appendix E for a comparison of management proposals for existing and potential recreation sites, areas, and trails.

The following roads would be designated and managed as Back Country Roads, a component of the National Scenic Byway System:

- 57 miles of the Smith River Road (BLM and Douglas County).

- 7 miles of the BLM South Sisters and East and West Oxbow roads.

- 28 miles of BLM and Douglas County roads between Mill Creek on Highway 38 to Tyee on the Umpqua River.

- 63 miles of the Coos Bay Wagon Road and the Myrtle Point to Sitkum roads.

Other roads would be considered for addition to the system on a case-by-case basis as the need or opportunity arises.

Off-highway vehicle use and motorized access would be limited to designated roads and trails throughout most of the district. A goal of 1.5-miles of open road per section (square mile) would be implemented wherever possible on BLM-managed lands. Accordingly, approximately half (about 780 miles) of existing roads would be closed and half open to vehicle use. In addition, approximately 8,400 acres (see Management Guidance Common to All

Alternatives for list of areas) would be designated as closed year-round to vehicle use other than for administrative purposes or commercial commodity extraction.

Wild and Scenic Rivers

The 9.5 river miles of New River from the outlet of Floras Lake to its mouth at the Pacific Ocean would be found suitable for designation as scenic. See Table 2-12 in Appendix E.

Visual Resources

Lands within existing boundaries designated by Congress for exclusive management (Squaw Island Wilderness and Cherry Creek RNA) and the North Sisters Rocks and Zwagg Island Wilderness Study Areas would be managed as VRM Class I. The remainder of BLM-administered lands would be managed as inventoried for their visual characteristics except as noted for rural interface areas (see below). Acres that would be managed for each VRM Class are shown in Table 2-1.

Land Tenure

Exchanges would be made to benefit one or more of the resources managed. Exchanges involving disposal of timber to acquire lands containing greater nontimber values would be emphasized. Sales of lands other than available commercial forest lands would be made to dispose of lands that meet criteria (1) or (2) of FLPMA Sec. 203(a), which are:

1) Such tract, because of its location or other characteristics, is difficult or uneconomical to manage as part of the public lands and is not suitable for management by another federal department or agency.

2) Such tract was acquired for a specific purpose and the tract is no longer required for that or any other federal purpose.

No lands would be leased, except in zones 2 and 3 where leases and conveyances would be made under the Recreation and Public Purposes Act to provide appropriate facilities or services.

BLM-administered lands located on the North Spit of Coos Bay would not be available for sale or exchange. Nonfederal lands within Coos County Comprehensive Plan Zoning Districts 2CS and 5A-CS considered valuable for recreation or wildlife could be acquired through exchange of forested lands in land tenure zones 2 and 3 on the remainder of the district.

Energy and Minerals

Leasable minerals would continue to be made available on the majority of the mineral estate administered by BLM. The majority would also remain open to location under the mining laws and to sale of salable minerals. See Tables 2-8, 2-9 and 2-10 in Appendix E.

Rural Interface Area

Approximately 2,100 acres of BLM-administered lands within 0.25 mile of private land in rural interface areas (zoned for 1 to 20-acre lots) would be managed for VRM Class II objectives. The following alternative timber management practices would be applied on those lands:

- The primary harvest method would be the group selection system, where the openings would generally be 10 acres or less in size.

- Additionally, when necessary, wider buffers would be provided on streams used for domestic water sources.

- Prescribed burning would not be utilized for site preparation, and herbicides would not be utilized in plantation maintenance or release treatments.

See Table 2-11 in Appendix E for comparison of identified Rural Interface Areas and related BLM management zones by alternative.

Management Direction Alternative E

Water Quality and Riparian Areas

RMAs would be established with the following average widths on each side of streams and other waters:

first order streams	50 feet
second order stream	60 feet
third order streams	140 feet
fourth order streams	200 feet
fifth order streams	280 feet

sixth order and larger streams	320 feet
Other water such as lakes	200 feet

Actual RMA widths would be determined by on-the-ground vegetation, terrain, and stream characteristics. No timber harvest would be planned within these RMAs, but some tree cutting or timber harvest activities could occur to achieve resource management objectives. Permitted activities may include road construction and yarding corridors to facilitate timber harvest outside the RMA, as well as wildlife and fish habitat improvement projects. All logging, burning, road construction and maintenance, and silvicultural practices would be designed to prevent degradation of water quality.

Old-Growth and Mature Forests

Forest lands in the TPCC categories of Nonsuitable and Suitable Woodland, Suitable Commercial Forest Land on Site V lands, and the Fragile Gradient-Restricted (FGR 2) component of the Fragile Suitable TPCC category would not be subject to planned harvest. Also not available for the management of forest products are other forest lands allocated for riparian-zone protection in RMAs, recreation sites, proposed wild river corridors, undisturbed protection of special status species, and ACECs. These forest lands total 98,900 acres, of which 22,500 acres currently are old growth and 25,100 acres are mature forest.

An additional 29,800 acres of existing old-growth forest stands and 12,700 acres of mature forest over 150 years old would not be subject to planned harvest. An additional 33,800 acres of forest land within 400 feet of these older stands would not be subject to planned harvest. Reservation of these stands would assist in maintaining natural ecological elements, protect the older stands from edge effect and natural disaster, and interconnect them into a sustainable network. Also, 22,100 acres of forest land not accounted for in previous categories, but lying within approximately two miles of spotted owl nests or habitat cores occupied in recent years, would not be subject to planned harvest. An additional 2,900 acres of forest land not accounted for in previous categories would not be subject to planned harvest to provide for protection of a 40-acre block in each section where BLM-administers at least half of the land, to provide habitat for amphibians and nesting for pileated woodpeckers.

Timber

Approximately 83,100 acres would be available for intensive management, and 25,600 acres would be available for restricted management of forest products. See Table 2-1.

Special Status Species Habitat

No activities would be undertaken or permitted that would jeopardize populations of federally-listed threatened or endangered plants or animals, or species officially proposed for such listing.

In addition to protecting federally-listed and proposed threatened or endangered species, habitats of federal candidate (Category 1 and 2), state listed, and Bureau sensitive species would be managed to enhance and where appropriate and, in all cases, so BLM would avoid contributing to the need to list such species. Field surveys would focus on any of these species suspected to be present in an area proposed for a specific site-disturbing activity. If such species are identified, their habitat would be protected. See Table 2-5 in Appendix E for a list of special status species and their protection by alternative.

Other Wildlife Habitat

During timber sale planning, suitable wildlife trees would be identified for retention. The target retention would include all soft snags consistent with safety standards; three hard snags per acre (at least 20 inches dbh and 10 feet tall); and two green trees (at least 20 inches dbh) per acre. In addition, 20 percent of the land in each harvest unit would be retained for cavity nester habitat in 2-acre patches.

Where available, a total of 350 linear feet per acre of down logs would be retained in final harvest timber sale units. These would include all Class 1 logs that are hollow or rotten, and Class 2 and 3 logs greater than 20 inches in diameter. Smaller material would be left on site unless removal is needed for tree planting.

Special habitats, considered to be significant by IDT review, would be buffered by 100 to 300 feet from surface disturbance and harvest of timber.

Special Areas

New River ACEC, Cherry Creek RNA, and Powers Environmental Education area would be retained. Cherry Creek would be designated as an RNA/

ACEC. Nine additional areas would be designated as ACECs (Wassen Creek, North Spit, North Fork Coquille River, Tioga Creek, China Wall, Upper Rock Creek, North Fork Hunter Creek, Hunter Creek Bog, and the North Fork Chetco River). See Table 2-6 in Appendix E.

In addition, the boundary of the proposed China Wall ACEC would be extended to the ridge lines to provide a more manageable area.

Recreation

The following existing BLM recreation sites and areas would continue to be managed and maintained for recreation use by BLM, some in partnership with other organizations:

- The Loon Lake/East Shore area would be designated as an SRMA.
- The Dean Creek Elk Viewing Area and New River ACEC would be designated as SRMAs with emphasis on management and maintenance of the watchable wildlife and environmental interpretation programs, and low impact recreational activities. Recreation facilities and activities at New River would be compatible with the basic goals of the New River ACEC Management Plan.
- Seven existing (Smith River Falls, Vincent Creek, Park Creek, Big Tree, Burnt Mountain Cabin, Bear Creek, and Palmer Butte) recreation sites and trails would continue to be maintained and managed for day use and overnight recreation use.
- The North Spit Boat Ramp would be managed to provide boating, fishing, and windsurfing access to the north shore of Coos Bay.

In addition to the existing developed areas and sites, three new SRMAs would be established and managed for recreational use and development as follows:

- Coos Bay Shorelands, featuring two areas—the North Spit of Coos Bay and Coos Head. Both areas currently provide opportunities for sightseeing, whale watching, storm watching and photography among other undeveloped recreational uses. In addition, the North Spit area provides opportunities for wildlife observation, fishing, crabbing, clam digging, camping, windsurfing, boating, horseback riding, hiking, OHV use and other dispersed activities.
- Gregory Point, featuring an interagency cultural heritage interpretative center with potential public access to the Cape Arago Lighthouse. This site provides a rich array of cultural, historic, scenic, and biological values suitable for cultural and natural history interpretation/education, Native American cultural appreciation, nature studies, photography, and wildlife observation.
- Sixes River, featuring camping, picnicking, swimming, fishing, floating, hiking and recreational gold panning and dredging. Recreation development opportunities include trails, historical site interpretation, construction of two boat ramps, and improving existing facilities.

In addition, 32 potential recreation sites would be managed for recreational use and development, or in a manner that would provide options for future recreational development. No timber sales other than salvage sales of dead and dying timber would be made during the life of the plan. An exception would be made in the event a natural catastrophe (e.g., fire, windstorm) destroyed the high value recreation potential of the area.

Additionally, the district would attempt to acquire lands or an easement for public access to lands adjacent to the Loon Lake SRMA to permit expansion of existing facilities and development of trails. The district would also attempt to acquire South Sisters Rock to provide access for day-use recreation at this site, including picnicking, wildlife viewing, nature study, and photography.

See Table 2-7 in Appendix E for a comparison of management proposals for existing and potential recreation sites, areas, and trails.

Portions of roads, as listed below, would be designated and managed as Back Country Roads (a component of the National Scenic Byway System):

- 57 miles of the Smith River Road (BLM and Douglas County).

- 7 miles of the BLM South Sisters and east and west Oxbow roads.
- 28 miles of BLM and Douglas County roads between Mill Creek on Highway 38 to Tyee on the Umpqua River.
- 63 miles of the Coos Bay Wagon Road and the Myrtle Point to Sitkum roads.

Other roads would be considered for addition to the system on a case-by-case basis as the need or opportunity arises.

Off-highway vehicle use and motorized access would be limited to designated roads and trails throughout most of the district. A goal of one mile of open road per section (square mile) would be implemented wherever possible on BLM-managed lands. Accordingly, approximately 525 miles of road would be designated as open and 1,040 miles as closed to vehicle use. In addition, approximately 2,000 acres (see Management Guidance Common to All Alternatives for list of areas) would be designated as closed year-round to vehicle use other than for administrative purposes or commercial commodity extraction.

Wild and Scenic Rivers

All rivers found eligible where BLM administers at least 15 percent of the adjoining land would be found suitable for inclusion in the National Wild and Scenic River System. This includes one river segment comprising 9.5 miles found suitable for potential scenic designation and six segments and 175 miles for recreational designation (see Table 2-12 in Appendix E).

Visual Resources

VRM Class I management would be provided for lands within boundaries designated by Congress for exclusive management, as follows:

- Squaw Island Wilderness and Cherry Creek RNA
- North Sisters Rock and Zwagg Island Wilderness Study Areas
- All BLM-administered lands adjacent (within 0.25 mile) to designated recreation sites, state and federal highways, state scenic waterways, and rivers designated under the federal Wild and Scenic Rivers Act.

VRM Class II management would be provided for lands in identified Rural Interface Areas and all remaining lands inventoried as VRM Class II. Lands inventoried as VRM Class III or IV would be managed as VRM Class III. Acres that would be managed for each VRM Class are shown in Table 2-1.

Land Tenure

Exchanges would be made to benefit one or more of the resources managed. Exchanges involving disposal of timber to acquire lands containing greater nontimber values would be emphasized. Sales of lands other than available commercial forest lands would be made to dispose of lands that meet criteria (1) or (2) of FLPMA Sec. 203(a), which are:

1) Such tract, because of its location or other characteristics, is difficult or uneconomical to manage as part of the public lands and is not suitable for management by another federal department or agency.

2) Such tract was acquired for a specific purpose and the tract is no longer required for that or any other federal purpose.

No lands would be leased, except in Zones 2 and 3 where leases and conveyances would be made under the Recreation and Public Purposes Act to provide appropriate facilities or services.

BLM-administered lands located on the North Spit of Coos Bay would not be available for sale or exchange. Nonfederal lands within Coos County Comprehensive Plan Zoning Districts 2CS and 5A-CS valuable for recreation or wildlife could be acquired through exchange of forested lands in land tenure zones 2 and 3 on the remainder of the district.

Energy and Minerals

Leasable minerals would continue to be made available on the majority of the mineral estate administered by BLM. The majority would also remain open to location under the mining laws and to sale of minerals that are salable. See Tables 2-8, 2-9, and 2-10 in Appendix E.

Rural Interface Areas

Approximately 6,700 acres of BLM-administered lands within 0.5 mile of private lands in rural interface areas (zoned for 1-acre to 20-acre lots) would be managed for VRM Class II objectives. Harvesting would employ multiple-aged or even-aged silvicultural systems where feasible from a logging and stand management perspective, and small (ten acres or smaller) clearcuts or shelterwoods elsewhere. The silvicultural systems employed would not include the use of prescribed fire or herbicides.

See Table 2-11 in Appendix E for comparison of identified Rural Interface Areas and related BLM management zones by alternative.

Management Direction Common to all Alternatives

Coordination and Consultation

The implementation of this RMP and the overriding SEIS ROD calls for a high level of coordination and cooperation among agencies. A formal procedure for interagency coordination has been created by a Memorandum of Understanding for Forest Ecosystem Management that has been entered into by the White House Office on Environmental Policy, the Department of the Interior, the Department of Agriculture, the Department of Commerce, and the Environmental Protection Agency. The memorandum of understanding (MOU) created several interagency groups, including the Interagency Steering Committee, Regional Interagency Executive Committee, and Regional Ecosystem Office. A detailed description of these groups is included in the SEIS ROD, Attachment A, Section E, Implementation.

Consultation under the Endangered Species Act will emphasize an integrated ecosystem approach. This will include involving the U.S. Fish and Wildlife Service and the National Marine Fisheries Service in all relevant implementation planning to ensure their views are known. Actions proposed to implement this RMP will undergo consultation, either formal or informal, as appropriate. Consultation for the northern spotted owl on activities that are consistent with the standards and guidelines of the SEIS ROD and that would not result in "take" of a listed species is expected to be informal. If "take" would result, incidental "take" statements would be provided through formal consultation.

Concurrent coordination will be done with the Environmental Protection Agency (EPA) and Oregon Department of Environmental Quality (DEQ) on water quality standards and beneficial use requirements of the Clean Water Act to minimize project impacts. Similar coordination will occur with the EPA, DEQ, and U.S. Forest Service to minimize impacts from prescribed burning emissions.

Use of the Completed Plan

Many management activities described in this RMP/EIS would be accomplished through contracts and permits with specific performance standards developed. The standards require the contractor or permittee to comply with applicable laws, regulations, policies, and plans. Selection of performance standards is governed by the scope of the action to be undertaken and the physical characteristics of the specific site. The standards, which include design features and mitigating measures, must be followed in carrying out an action.

Site-specific planning by interdisciplinary teams (IDTs) will precede most on-the-ground management activities. IDTs are comprised of relevant resource management disciplines. The IDT process includes field examination of resources, selection of alternative management actions, analysis of alternatives, and documentation to meet National Environmental Policy Act requirements. Adjacent land uses will be considered during site-specific land management planning.

In addition to being routinely monitored, the RMP will be formally evaluated at the end of every third year after implementation begins. This periodic evaluation will occur until such time as preparation of new plans supersedes the RMP over a substantial majority of its area. The reason for the formal evaluation is to determine whether there is significant cause for an amendment or revision of the plan. Evaluation includes a cumulative analysis of monitoring records, with the broader purpose of determining if the plan's goals and objectives are being, or are likely to be, met and whether the goals and objectives were realistic and achievable in the first place.

Evaluation will also assess whether changed circumstances (such as changes in the plans of other government agencies or Indian tribes) or new information so altered the levels or methods of activities or the expected impacts (on water, wildlife, socioeconomic conditions, etc.), that the environmental consequences of the plan may be seriously different than those anticipated in the PRMP/FEIS.

As part of these third year evaluations, the allowable sale quantity will be re-evaluated to incorporate the results of watershed analyses; monitoring; further inventory; and site-specific, watershed-specific or province-level decisions.

If an evaluation concludes that the plan's goals are not achievable, a plan amendment or revision will be initiated. If the evaluation concludes that land use allocations or management direction need to be modified, a plan amendment or revision may be appropriate. An analysis will address the need for either. If the analysis determines that amending the plan is appropriate, the amendment process set forth in 43 CFR 1610.5-5 or 1610.5-6 would be followed. If an amendment is not appropriate, NEPA procedures would still be followed before the modification is approved, along with coordination through the Regional Ecosystem Office and the Regional Interagency Executive Committee if SEIS ROD standards and guidelines or land-use allocations would be modified. Figure 2-4 shows how monitoring and/or evaluation could lead to a revision of management direction or other changes in the RMP.

No additional evaluations of this type would be done unless some changed circumstance or unusual event causes the continuing validity of the plan to be questioned. Following completion of each plan evaluation, a summary of its findings will be included in the district's annual program summary.

In the future—after preparation of new plans that would substantially supersede the RMP is well under way—interim management adjustments may be made without a plan amendment if some circumstances change or unusual events occur of a magnitude that question BLM's ability to meet the remaining objectives. The kind of circumstance which could lead to such an adjustment might be an announcement of research findings that clearly establish some of the plan's goals and objectives are unlikely to be met. The kind of unusual event which could lead to such an adjustment might be a major catastrophe such as a wildfire or windstorm causing extensive damage to forest stands. Similar interim adjustments can be made at any time during the life of the plan, pending evaluation and possible plan amendment.

Adaptive Management

This approach to evaluation and interim adjustment will frame a process of adaptive management, permitting effective response to changing knowledge. Adaptive management is a continuing process of action-based monitoring, researching, evaluating and adjusting with the objective of improving the implementation and achieving the goals of the RMP. The RMP is based on current scientific knowledge. To be successful, it must have the flexibility to adapt and respond to new information. Under the concept of adaptive management, new information will be evaluated and a decision will be made whether to make adjustments or changes. The adaptive management approach will enable resource managers to determine how well management actions meet their objectives and what steps are needed to modify activities to increase success or improve results.

The adaptive management process will be implemented to maximize the benefits and efficiency of the RMP. This may result in the refinement of management direction or land-use allocations which may require amendment of the RMP. Adaptive management decisions may vary in scale from individual watersheds, specific forest types, physiographic provinces, or the entire planning area. Many adaptive management modifications may not require formal changes to the RMP.

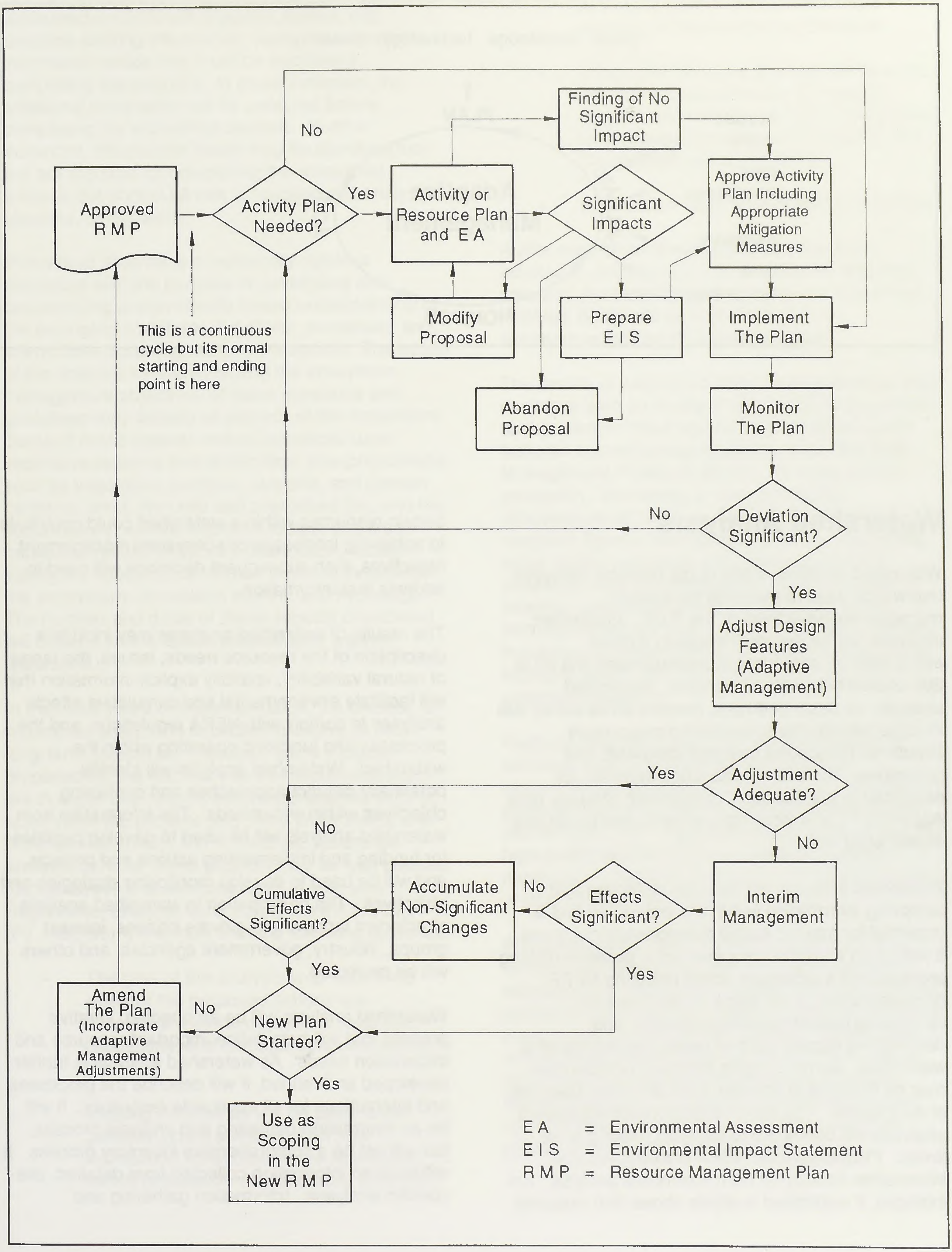
The model displayed in Figure 2-5 identifies the various steps, activities, and outline of a procedure for the adaptive management process. This diagram conveys the general concept and is valuable as a starting point for understanding adaptive management. A full, detailed explanation of the model—which is beyond the scope of this discussion—would require that each step be further described and defined.

New information that would compel an adjustment of strategy may come from monitoring, research, statutory or regulatory changes, organizational or process assessments, or any number of additional sources. During the evaluation process, personnel will analyze the information to determine the nature, scope, and importance of the new information.

Adaptive management could entail modification of silvicultural prescriptions in response to increasing knowledge providing greater certainty about anticipated climate change or in response to increasing knowledge about the habitat needs of spotted owls, to cite two examples that could have widespread application. Adaptive management could equally entail modification of rather localized management practices to respond to the results of monitoring.

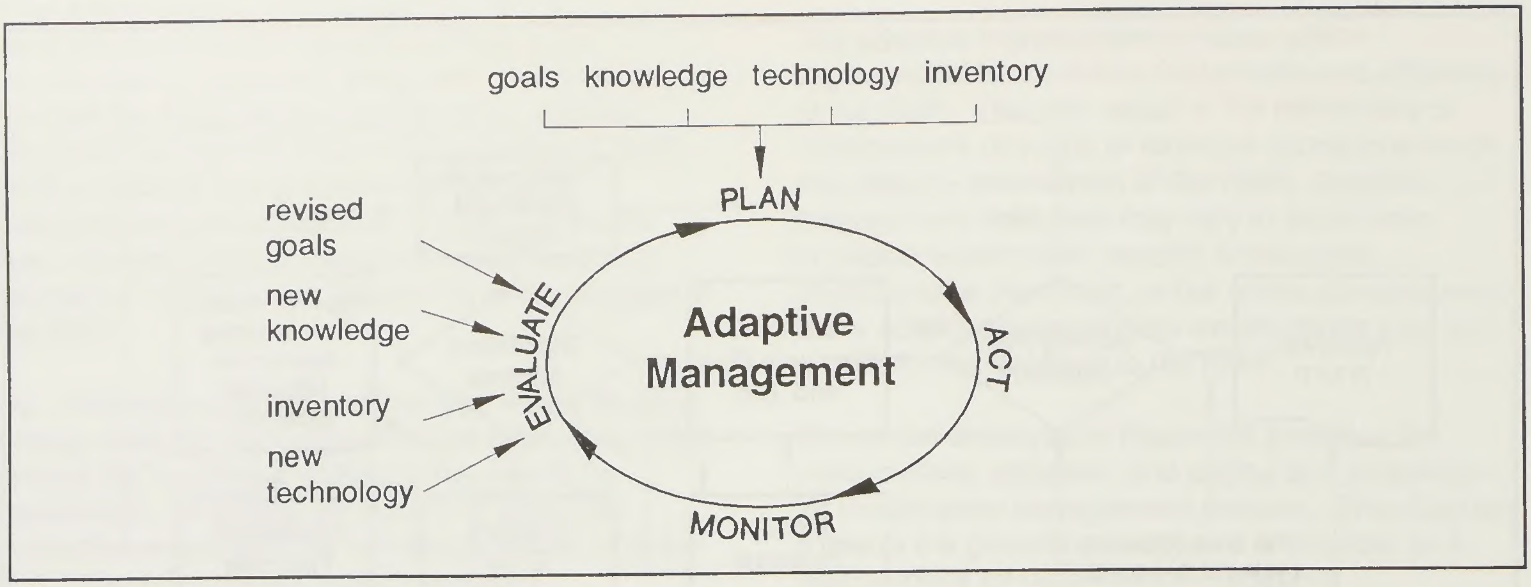
Any potential new management actions identified after RMP/ROD approval would be reviewed before BLM implements them. For example, if a new ACEC proposal meets BLM criteria for consideration, the District Manager may prescribe interim management measures for the remaining life of the plan. Such interim management must meet the objectives of the RMP, except where inconsistent with the regulations regarding potential ACECs, and would be subject to analysis in an EIS or environmental assessment linked to a proposed plan amendment or a broader plan revision.

Figure 2-4. Process for Changing the Resource Management Plan


Approved R M P
Activity Plan Needed?
No
Yes
Activity or Resource Plan and E A
Finding of No Significant Impact
Significant Impacts
Approve Activity Plan Including Appropriate Mitigation Measures
Modify Proposal
Prepare E I S
Implement The Plan
This is a continuous cycle but its normal starting and ending point is here
Abandon Proposal
Monitor The Plan
Deviation Significant?
No
Yes
Adjust Design Features (Adaptive Management)
Adjustment Adequate?
Yes
No
Interim Management
Effects Significant?
No
Yes
Accumulate Non-Significant Changes
Cumulative Effects Significant?
No
Yes
New Plan Started?
No
Yes
Amend The Plan (Incorporate Adaptive Management Adjustments)
Use as Scoping in the New R M P

E A = Environmental Assessment
E I S = Environmental Impact Statement
R M P = Resource Management Plan

Figure 2-5. Basic Adaptive Management Model



Watershed Analysis

Watershed analysis is one of the principal analyses that will be used to meet the ecosystem management objectives of this RMP. Watershed analyses will be the mechanism to support ecosystem management at approximately the 20 to 200 square mile watershed level. Watershed analysis, as described here, focuses on its broad role in implementing the ecosystem management objectives prescribed by these standards and guidelines. The use of watershed analysis, as described in the Aquatic Conservation Strategy (see Appendix F), is a more narrow focus and is just one aspect of its role.

Watershed analysis will focus on collecting and compiling information within the watershed that is essential for making sound management decisions. It will be an analytical process, not a decision-making process with a proposed action requiring NEPA documentation. It will serve as the basis for developing project-specific proposals, and determining monitoring and restoration needs for a watershed. Some analysis of issues or resources may be included in broader scale analyses because of their scope. The information from the watershed analyses will contribute to decision making at all levels. Project-specific NEPA planning will use information developed from watershed analysis. For example, if watershed analysis shows that restoring certain resources within a watershed could contribute to achieving landscape or ecosystem management objectives, then subsequent decisions will need to address that information.

The results of watershed analyses may include a description of the resource needs, issues, the range of natural variability, spatially explicit information that will facilitate environmental and cumulative effects analyses to comply with NEPA regulations, and the processes and functions operating within the watershed. Watershed analysis will identify potentially disjunct approaches and conflicting objectives within watersheds. The information from watershed analysis will be used to develop priorities for funding and implementing actions and projects, and will be used to develop monitoring strategies and objectives. The participation in watershed analysis of adjacent landowners, private citizens, interest groups, industry, government agencies, and others will be promoted.

Watershed analysis will be an ongoing, iterative process that will help define important resource and information needs. As watershed analysis is further developed and refined, it will describe the processes and interactions for all applicable resources. It will be an information-gathering and analysis process, but will not be a comprehensive inventory process. It will build on information collected from detailed, site-specific analyses. Information gathering and analysis will be related to management needs, and not be performed for their own sake. While generally watershed analysis will organize, collate, and describe existing information, there may be critical information needs that must be met before completing the analysis. In those instances, the additional information will be collected before completing the watershed analysis. In other instances, information needs may be identified that are not required for completing the watershed analysis but should be met for subsequent analyses, planning, or decisions.

Watershed analysis is a technically rigorous procedure with the purpose of developing and documenting a scientifically-based understanding of the ecological structures, functions, processes, and interactions occurring within a watershed. The scope of the analysis for implementing the ecosystem management objectives of these standards and guidelines may include all aspects of the ecosystem. Some of these aspects include beneficial uses; vegetative patterns and distribution; flow phenomena such as vegetation corridors, streams, and riparian corridors; wind; fire (wild and prescribed fire, and fire suppression); wildlife migration routes; dispersal habitat; terrestrial vertebrate distribution; locally significant habitats; human use patterns throughout the ecosystem; cumulative effects; and hydrology. The number and detail of these aspects considered will depend on the issues pertaining to a given watershed.

In the initial years of implementation, the process for watershed analysis is expected to evolve to meet long-term objectives. However, some projects proposed for the first few years of implementation are in areas that require watershed analysis prior to approval of the projects (e.g., Key Watersheds and Riparian Reserves). In FY 1995-96, watershed analysis done for these projects may be less detailed than analyses that are completed in later years. Regardless, analysis done during the initial years (FY 1995-96) will comply with the following guidance:

- The goal of the analysis is to determine whether the proposed actions are consistent with the objectives, land-use allocations, and management direction of the RMP.
- Existing information will be used to the greatest extent possible, with new information collected—to the maximum extent practicable—to fill crucial data gaps.
- Analysis will address the entire watershed, even though some areas may be analyzed at a lower level of precision, and the analysis of issues may be prioritized.
- Information from the analysis will flow into the NEPA documentation for specific projects and will be used where practicable to facilitate Endangered Species Act and Clean Water Act compliance.
- Restoration opportunities will be identified.

A pilot watershed analysis program has been initiated to develop and test an effective long-term process. A scientifically peer-reviewed Watershed Analysis Guide will be finalized based on experiences gained in the pilot program.

The results of watershed analysis will influence final decisions both on timing of land-disturbing activities such as timber sales and on application of design features and mitigating measures, including Best Management Practices (BMPs) for water quality protection. Monitoring and evaluating the effectiveness of BMPs is required by Oregon's Nonpoint Source Management Plan to ensure that water quality standards are achieved and that beneficial uses are maintained. When monitoring identifies previously unanticipated impacts, the information gained from that monitoring will be used in subsequent development of mitigating measures, including BMPs, and also considered in future watershed analyses.

Factored into these decisions on land-disturbing activities, where appropriate, would be an assessment of compliance with the anti-degradation policy of Oregon's Water Quality Standards (OAR 340-41-026[1.a]). These standards apply to existing high quality waters which exceed those levels necessary to support recreation and the propagation of fish, shellfish, and wildlife.

Proposed timber sales and other land-disturbing activities will incorporate the interactive (adaptive management) process for developing, implementing, and evaluating nonpoint control (BMPs) to determine if water quality goals have been met. Modification of non-point-source controls, including BMPs, will be adjusted based upon sound scientific evidence. Where necessary, appropriate actions to mitigate adverse effects on water quality will be taken to protect designated beneficial uses.

Requirement for Further Environmental Analysis

Site-specific planning by Interdisciplinary Teams (IDTs) would precede most on-the-ground management activities. IDTs are comprised of relevant resource management disciplines. The IDT process includes field examination of resources, identification of alternative management actions, and analysis. Adjacent land uses would be considered during site-specific land management planning.

Site-specific Environmental Analysis and documentation (including environmental assessments (EAs), categorical exclusions, or administrative determinations where appropriate, and RMP conformance determination) would be accomplished for each action or type of treatment under consideration. Where the action is to be accomplished by a contractor or timber sale purchaser, the EA or other environmental analysis is a primary means for determining appropriate contract stipulations. Where the action is to be accomplished by BLM personnel, the environmental analysis is a primary means for determining how the action will be conducted. When determining whether activities retard or prevent attainment of Aquatic Conservation Strategy objectives, the scale of analysis typically will be BLM analytical watersheds or similar units.

Watershed analysis or province analysis will often precede environmental analysis of specific proposals, and the findings of such preceding analyses will be addressed in documentation of the environmental analyses. Similarly, late-successional reserve assessments will precede activities in those reserves and their findings will be addressed in environmental analysis of those activities. Ultimately, watershed analysis will serve as the basis for developing project-specific proposals and determining monitoring and restoration needs for a watershed. Project-specific NEPA planning will use information developed from watershed analysis. By improving understanding of the ecological structures, functions, processes, and interactions occurring within a watershed, watershed analysis will enhance the ability to predict direct, indirect and cumulative impacts of specific proposals in that watershed.

General

Analyses of proposals for the use of prescribed fire will adhere to the requirements of the Clean Air Act and the State Implementation Plan (including the Visibility Protection Plan and Smoke Management Plan). To evaluate whether BLM actions comply with the State Implementation Plan, conformity determinations will be conducted in association with site-specific environmental analysis where emissions can be most reasonably forecasted in quantified terms. These analyses will specifically evaluate the effects of project-specific prescribed burning on nonattainment areas.

Accurate assessment of local and airshed-level air quality effects of ecosystem management may require cumulative effects analysis, reflecting all relevant BLM actions, as well as expected actions of other parties. Coordination with other agencies is implicit. Cumulative effects analysis will include consideration of the effects on visibility and regional haze. Where extensive fuel hazard reduction by prescribed burning is considered, the analysis also will consider the impact of burning on wildfire emissions. This will be done in a quantified tradeoff analysis, comparing emissions from prescribed fire with potential emissions from wildfires if prescribed burning is not accomplished. Factors considered when establishing the geographic boundaries for a cumulative effects analysis include whether the action will result in impacts that cross administrative boundaries, and whether the action will affect sensitive air quality regions (e.g., Class I areas and nonattainment areas). Resultant analysis may be based on airsheds.

Interdisciplinary impact analysis will be tiered within the framework of this and other applicable Environmental Impact Statements (EISs). Tiering is used to prepare more specific documents without duplicating relevant parts of previously-prepared general documents. The more specific EA or other environmental analysis cannot lead directly to a change in the decisions based on the more general EIS to which it is tiered. It could, however, result in some interim management direction pending plan revision, or a proposal to amend the plan. If an EA indicates potential for significant impacts that are seriously different from those described in an existing EIS, a new EIS (or supplement to this or another EIS) may be required.

Specific proposals for treatment to manage competing vegetation would be addressed in site-specific EAs tiered to BLM's EIS, *Western Oregon Program-Management of Competing Vegetation*, 1989. Specific proposals for control of noxious weeds would be addressed in site-specific EAs tiered to BLM's EIS, *Northwest Area Noxious Weed Control Program*, 1986 as supplemented in 1987.

Availability of EAs for public review will be announced in a minimum of one, and generally all, of the following ways:

- News release distributed to the newsroom of area newspapers, TV, and radio stations.
- Notices posted in the public area at the Coos Bay District Office.
- Mailings to known interested/affected people, groups, tribal units, governmental agencies, and businesses. These mailings may include, but are not limited to, District Program Periodic District Planning and Project Update progress reports.
- Legal notices in one or more newspapers circulated in the project area.

Management Assessments and Plans

A management assessment will be prepared for each large Late-Successional Reserve (or group of smaller Late-Successional Reserves) before habitat manipulation activities are designed and implemented. These assessments may be developed as part of province-level planning or as stand-alone assessments. If developed to stand alone, the assessments will be closely coordinated with subsequent watershed analysis and province-level planning. SEIS ROD standards and guidelines should be refined at the province level prior to development of Late-Successional Reserve assessments. Late-Successional Reserve assessments will generally include:

- History and inventory of overall vegetative conditions within the reserve.
- List of identified late-successional associated species known to exist within the Late-Successional Reserve and information on their locations.
- History and description of current land uses within the reserve.
- Fire management plan.
- Criteria for developing appropriate treatments.
- Identification of specific areas that could be treated under those criteria.
- Proposed implementation schedule tiered to higher order (i.e., larger scale) plans.
- Proposed monitoring and evaluation components to help evaluate if future activities are carried out as intended and achieve desired results.

Only in unusual circumstances will silvicultural treatments, including prescribed fire, precede preparation of this management assessment. Late-Successional Reserve assessments are subject to review by the Regional Ecosystem Office. Until Late-Successional Reserve assessments are completed, fire suppression activities should be guided by land allocation objectives in coordination with local resource management specialists.

Projects and activities within Late-Successional Reserves (including restoration, recreation, projects for public safety, thinning, and salvage) may proceed in fiscal years 1995-96 using initial Late-Successional Reserve assessments done at a level of detail sufficient to assess whether the activities are consistent with the objectives of the Late-Successional Reserves.

Management of Newly Acquired Lands

Lands may come under BLM administration after completion of the RMP/ROD through exchange, donation, purchase, revocation of withdrawals of other Federal agencies, or relinquishment of Recreation and Public Purpose Act leases. Newly acquired or administered lands or interests in lands would be managed for their highest potential or for the purposes for which they are acquired. For example, lands acquired within “special management areas” with Congressional or RMP allocation/ direction will be managed in conformance with guidelines for those areas. If lands with unique or fragile resource values are acquired, it may be appropriate to protect those values until the next plan revision.

Lands acquired with no identified special values or management goals would be managed in the same manner as surrounding or comparable BLM-administered lands. This implies typical timber harvest opportunities, intensive timber management practices, management of the mineral estate, standard operating procedures, and pre-committed mitigation measures.

Costs of Management

The costs of implementing the alternatives would vary, primarily according to the complexity of management proposed, the amount of timber that would be offered for sale, and the intensity of management of other resources.

Those alternatives that propose mostly traditional timber management approaches (NA, A, B, D and E), even though they allocate widely variable acreage for that purpose, would entail timber management costs essentially proportional to the proposed timber sale volume. These would be consistent with past management costs for this purpose. The alternatives that exclude the most lands from timber harvest would tend to increase costs per unit of timber sold, as necessary road investments and maintenance costs would be prorated against less volume. Countervailing savings may occur, however, as the more restrictive alternatives tend to leave those lands requiring the least costly mitigation available for harvest.

In contrast, the costs of non-traditional forest management as proposed in the PRMP and Alternative C would be much higher per unit of timber sold than for the other alternatives. The PRMP—with its requirements for watershed analysis, Late-Successional Reserve assessments, and watershed restoration—entails costs not associated with the other alternatives. Many of these additional costs of the PRMP and Alternative C are associated with the ecosystem management approach which focuses on functions of ecosystems. Because many of these functions and related forest conditions are not recognized in quantifiable market values, many expected outcomes will not be realized until several years after investments are made.

The annual cost of implementing Alternative NA would be similar to the Coos Bay District's Fiscal Year 1993 budget, with slight adjustment for inflation, or approximately 12.1 million dollars. Cost estimates for Alternatives A, B, C, D and E have not been developed. The initial annual cost of implementing the PRMP is reflected in the President's Fiscal Year 1995 budget, which has approximately 18.1 million dollars for the Coos Bay District. There is not yet, however, a clear understanding of what the management needs and costs of the ecosystem management approach will be, so future year budget estimates may differ as experience is gained in implementing the PRMP.

The Budget Link

Timber sale levels and associated programs will be reduced if annual funding is not sufficient to support the relevant actions assumed in the plan, including mitigation and monitoring. The extent of the reduction will be based on the principle of program balance as envisioned in the plan. For example, if funding in a given year is sufficient only to support half of planned annual investments in precommercial thinning, the otherwise anticipated timber sale volume for that year would be reduced by half of the portion of the declared allowable sale quantity (ASQ) attributable to precommercial thinning. If, in subsequent years, budget levels permit BLM to eliminate the backlog of unfunded investments that have accumulated, timber sale levels will be adjusted upward to the extent that the work can be accomplished. If subsequent budget levels create a cumulative shortfall over a few years, the ASQ will be adjusted downward.

This principle will apply similarly to management of roads and other facilities. If maintenance of such facilities is not adequately funded, some of them may be closed to scale back management commitments to the level that is budgeted.

Monitoring

The BLM planning regulations (43 CFR 1610.4-9) call for the monitoring and evaluation of resource management plans at appropriate intervals.

Monitoring is an essential component of natural resource management because it provides information on the relative success of management strategies. The implementation of the RMP will be monitored to ensure that management actions: follow prescribed management direction (implementation monitoring), meet desired objectives (effectiveness monitoring), and are based on accurate assumptions (validation monitoring) (see Appendix R). Some effectiveness and most validation monitoring will be accomplished by formal research.

Monitoring will be an integral component of many new management approaches such as adaptive management and ecosystem management.

Adaptive management is based on monitoring that is sufficiently sensitive to detect relevant ecological changes. In addition, the success of adaptive management depends on the accuracy and credibility of information obtained through inventories and monitoring. Close coordination and interaction between monitoring and research are essential for the adaptive management process to succeed. Data obtained through systematic and statistically valid monitoring can be used by scientists to develop research hypotheses related to priority issues. Conversely, the results obtained through research can be used to further refine the protocols and strategies used to monitor and evaluate the effectiveness of RMP implementation.

Monitoring results will provide managers with the information to determine whether an objective has been met, and whether to continue or modify the management direction. Findings obtained through monitoring, together with research and other new information, will provide a basis for adaptive management changes to the plan. The processes of monitoring and adaptive management share the goal of improving effectiveness and permitting dynamic response to increased knowledge and a changing landscape. The monitoring program itself will not remain static. The monitoring plan will be periodically evaluated to ascertain that the monitoring questions and standards are still relevant and to make adjustments as appropriate. Some monitoring items may be discontinued, and others may be added as knowledge and issues change with implementation.

Watershed analysis is one of the principal analyses that will be used to meet the ecosystem management objectives. Information from watershed analysis will also be used in developing monitoring strategies and objectives. Specific to monitoring, the results and findings from watershed analysis are used to reveal the most useful indicators for monitoring environmental change, detect magnitude and duration of changes in conditions, formulate and test hypotheses about the causes of the changes, understand these causes and predict impacts, and manage the ecosystem for desired outcomes. Watershed analysis will provide information about patterns and processes within a watershed and about monitoring at that scale.

The monitoring process will collect information in the most cost effective manner and may involve sampling or remote sensing. Monitoring could be so costly as to be prohibitive if it is not carefully and reasonably designed. Therefore, it will not be necessary or desirable to monitor every management action or direction. Unnecessary detail and unacceptable costs will be avoided by focusing on key monitoring questions and proper sampling methods. The level and intensity of monitoring will vary, depending on the sensitivity of the resource or area and the scope of the proposed management activity.

RMP monitoring will be conducted at multiple levels and scales. Monitoring will be conducted in a manner that allows localized information to be compiled and considered in a broader regional context, addressing both local and regional issues. At the project level, monitoring will examine how well specific management direction has been applied on the ground and how effectively it produces expected results. Monitoring at broader levels will measure how successfully projects and other activities have achieved the objectives for those management areas.

Monitoring will be coordinated with other appropriate agencies and organizations to enhance the efficiency and usefulness of the results across a variety of administrative units and provinces. The approach will build on past and present monitoring work. In addition, specific monitoring protocols, criteria, goals, and reporting formats will be developed, subject to review and guidance of the Regional Ecosystem Office. This guidance will be used to augment and revise the monitoring plan and to facilitate the process of aggregating and analyzing information on provincial or regional levels.

Monitoring results will be reported in an Annual Program Summary, to be published starting the second year following initial implementation of this RMP. The Annual Program Summary will track and assess the progress of plan implementation, state the findings made through monitoring, specifically address the Implementation Monitoring Questions posed in each section of this Monitoring Plan, and serve as a report to the public.

Each resource area will be responsible for the collection, compilation, and analysis of much of the data gained through monitoring activities. Resource areas will report their findings and recommendations to the district for consolidation and publication in the Annual Program Summary.

The monitoring plan for the RMP is tiered to the Monitoring and Evaluation Plan for the SEIS Record of Decision. Because that Monitoring and Evaluation Plan is not yet fully refined, this Monitoring Plan is not complete. BLM has been, and will continue to be, a full participant in the development of the SEIS Monitoring and Evaluation Plan. Ongoing BLM effectiveness and validation monitoring will continue where it is relevant to Resource Management Plan direction (e.g., stocking surveys, threatened and endangered species studies, and water quality measurements).

The SEIS and RMP monitoring plans will not identify all monitoring the Coos Bay District will do. Activity and project plans may identify monitoring needs of their own.

Research

A research plan will be developed by the Research and Monitoring Committee identified in the SEIS ROD.

Ongoing research in Riparian Reserves will be analyzed to ensure that significant risk to the watershed does not exist. If significant risk is present and cannot be mitigated, study sites will be relocated. Some activities not otherwise consistent with the objectives may be appropriate, particularly if the activities will test critical assumptions of the President's Forest Plan; will produce results important for establishing or accelerating vegetation and structural characteristics for maintaining or restoring aquatic and riparian ecosystems; or represent continuation of long-term research. These activities will be considered only if there are no equivalent opportunities outside of Riparian Reserves and Key Watersheds.

Chapter 3
Affected Environment

Summary of Major Changes

General

- All maps are located in the map package.
- Tables have been updated as noted.

Lands and Transportation

- Withdrawal status has been updated.
- Information on state ownership has been included.

Water Resources

- The discussion on watershed condition has been revised.

Biological Diversity (including Forest/Ecological Health)

- The discussion on Forest Health has been expanded and moved from the Vegetation section.

Vegetation

- A discussion on bryophytes, fungi, lichens,and vascular plants has been added.
- A section on Special Forest Products has been added.
- The discussion on Noxious weeds has been expanded.

Special Status and SEIS Special Attention Species

- The discussion on plant species found on the district has been expanded.
- Discussions on the northern spotted owl, marbled murrelet, and snowy plover have been expanded.
- A section on the Western pond turtle has been added.
- A discussion on SEIS Special Attention Animal species has been added.

Special Areas

- Acres included in Special Areas have been corrected.

Recreation

- Additional information has been included on sailboarding and mountain biking.

Socioeconomics

- Additional information has been included on employment, personal income, local initiatives, Ballot measure 5, and Special Forest Products.

Fire

- This is a new section.

Introduction

This chapter describes the physical, biological and socioeconomic characteristics of the BLM-administered lands as they now exist on the district. Emphasis has been placed on resources that could be affected by BLM management alternatives as described in Chapter 2. Information provided is commensurate with the importance of impacts, with less important material summarized or referenced.

The primary sources of information used in preparing this chapter were BLM Planning System documents developed by the district. The Analysis of the Management Situation (AMS) and other resource inventories are available for review at the Coos Bay District Office, 1300 Airport Lane, North Bend, Oregon 97459, during normal working hours. Other resource references are cited within the text by author and date of publication. A listing of these references appears in the References Cited section of Chapter 6.

Preparation of this chapter is largely dependent on the Bureau Automated Resource Data (ARD) and supporting Geographic Information System (GIS). Acres used, unless otherwise noted, are derived from ARD/GIS. Since these acres are computer generated, the acreage may differ from those shown on the Master Title Plats (MTP), which are derived from past cadastral surveys and General Land Office records. Likewise, ARD acres may also differ from previously published BLM statistics, inventory records, timber sale maps or similar documents. MTP acreage is utilized in legal descriptions, land transactions and other documents. The difference between MTP and GIS/ARD acres for the district is less than 0.75 percent.

Climate

The climate of the area is moist and temperate due to prevailing westerly winds and the proximity of the Pacific Ocean. Winters are generally cool and wet, and summers warm and dry. Precipitation along the coast averages about 60 inches a year, but increases at higher elevations and inland to over 100 inches annually. The heaviest periods of precipitation usually occur during the months of November, December and January and may account for nearly 50 percent of the annual rainfall. Snow is of little significance, especially adjacent to the ocean. At higher elevations inland, snowfall is generally light and of short duration.

Humidity also varies by season and distance from the ocean. During the wet season the humidity will range between 50 and 100 percent throughout the district. During summer the humidity along the coastal areas remains high, resulting in what is locally called the "fog belt." Inland humidity, which is generally lower during the summer, approximates typical levels for the Umpqua and Willamette valleys. During periods of strong easterly winds, the humidity will decrease to 10-20 percent.

The mean temperature along the coast generally ranges from a low of 46 degrees in January to 60 degrees in August. Inland this variation is greater with below freezing temperatures common during the winter, and summer temperatures 90 degrees or higher.

The frost-free season averages between 150 and 250 days. The growing season averages 250 days at lower elevations along the coast, and decreases to 150 days at elevations in excess of 3,000 feet.

Summer winds are generally steady, north-northwesterly, averaging 17 miles per hour. Winter winds are generally steady offshore breezes from the south-southwest, averaging 15 miles per hour with occasional southwesterly gales exceeding 70 miles per hour. Along with these gales there may be rainfalls of 4 to 6 inches in a 24-hour period.

Topography and Geology

The topography of the district is rugged and highly dissected with steep narrow canyons. Elevations range from sea level to 2,858 feet at Roman Nose Mountain in the north and 3,432 feet at Bosley Butte in the south. Slopes of 70 to 100 percent are common.

There are no general exposure aspects. The Coast Range has a basic eastern and western aspect; however, the broken land pattern and scattered nature of BLM-administered lands preclude large percentages of any one aspect.

The district contains portions of two physiographic provinces— the Coast Range and the Klamath Mountains. The dividing line is generally accepted as the Middle Fork of the Coquille River, although intrusions from the Coast Range extend into the Klamath Province as far south as Agness, and intrusions of the Klamath Province extend into the Coast Range near Myrtle Point and Bridge.

The Coast Range Province is comprised mostly of sandstones and mudstones deposited during the Eocene Epoch (37-54 million years ago). Scattered volcanic material also occurs near the southern boundary.

The Klamath Mountain Province is more complex than the Coast Range. Rocks are chiefly of the Mesozoic Age (65-225 million years ago) and are highly faulted and sheared sedimentary, metamorphic, and igneous rocks. The most common rock types are sandstone, siltstone, schist and serpentine. Breccias, granites, lava and chert occur locally in smaller amounts (Townsend et al. 1977).

Lands and Transportation

Land Status

BLM-administered lands comprise approximately 12 percent of the planning area and are primarily in a checkerboard ownership pattern as shown on Map 1-2. Administration of these lands is subject to their land status which governs resource management. Table 1-1 (Chapter 1) shows acreage of BLM-administered land by county and land status.

Land Tenure

The district has had eight land actions affecting BLM-administered acreage since 1984. There have been some lands acquired through fee acquisition, revocation of withdrawals and acquisitions via exchanges, and other lands disposed through exchange and sale. These land actions have resulted in the acquisition of 3,148 acres and disposal of 716 acres. The district currently (1994) has three documented proposals requesting the sale of 42 acres of Public Domain land.

The district also has three documented large timberland exchange proposals which, if implemented, could result in the exchange of 30,533 acres of BLM-administered land for 51,209 acres of non-federal land. In addition to the large documented exchange proposals, the district is currently processing two small exchange proposals, and other inquiries and verbal proposals are received on a regular basis.

A land tenure adjustment scenario based on a three-zone concept as presented in Chapter 2 could be utilized for land tenure adjustments to benefit management of resources (e.g., timber, wildlife habitat, and recreation).

Possible offered and selected lands are listed in the Land section of the Analysis of the Management Situation document. The above noted land tenure adjustment proposals which are in various stages of processing are displayed in Table 3-1. The listed acreages do not constitute final exchange acres, but rather a pool of lands available for selection to achieve an equal value transaction.

Non-federal lands that BLM has specifically considered for acquisition include lands located on the North Spit of Coos Bay, lands adjacent to the New River ACEC, and lands adjacent to the Dean Creek Elk Viewing Area. Acquisition potential is described in the management plan for each of these areas.

The Weyerhaeuser effluent lagoon right-of-way grant on the North Spit of Coos Bay in Sections 6 and 7, T. 25 S., R. 13 W., (OR 47060) has been extended temporarily during the planning process. Options for the grant include renewal for a longer term, termination, or disposal of the lands to Weyerhaeuser by sale or exchange.

Those portions of Sections 7 and 18, T. 25 S., R. 13 W., located on the North Spit of Coos Bay within Coos County Comprehensive Plan, Zoning District 3E-WD (Water-Dependent Development Shorelands) could be offered for sale, exchange or lease to accommodate the local need for economic expansion and industrial development. Similarly, the N1/2NW1/4 Section 4, T. 25 S., R. 13 W., zoned Water-Dependent Development Shorelands (6-WD), could be made available.

Two FLPMA Section 302 residential leases for 0.86 acres in Section 13, T. 27 S., R. 12 W. (ORE 06161) and 1.32 acres in Section 5, T. 27 S., R. 11 W., (ORE 05664) could be offered for sale or exchange to the current lease holders.

The State of Oregon holds title to the submerged and submersible land of all tidal waters and beds of navigable rivers and lakes in the state. The Division of State Lands administers these lands. The following waterways in the planning area have been determined to be navigable, or are claimed by the state to be navigable:

- Umpqua River - from the mouth to above the district boundary.
- Smith River - from the Umpqua River to river mile 23.5 (near Spencer Creek).
- Coquille River - from the mouth to the junction with the South Fork Coquille River.
- North Fork Coquille - from the Coquille River to river mile 18.8, the confluence with Middle Creek.
- East Fork Coquille - from the North Fork Coquille River to river mile 8 (Minard Riffle).
- South Fork Coquille - from the Coquille River to river mile 24.1, the confluence of Roland Creek.

Table 3-1. Land Tenure Adjustment Proposals

Exchange Proponent	BLM Acreage Available For Exchange	Proponent Acreage Available For Exchange
Georgia-Pacific Corporation	22,707	40,015
John Hancock Company	1,859	3,460
South Coast Lumber Company	5,967	7,734
International Port of Coos Bay	141	157
Crook Estate	40	160
Total	**30,714**	**51,526**

Data as of February 1994.

- Rogue River - from the mouth to above the district boundary.

The state also administers land on the following rivers based on tidal influence:

- Coos River System - from the Pacific Ocean to the head of tide on the South Fork Coos River by Dellwood.
- Millicoma River - from the South Fork Coos River to the head of tide by Allegany.
- Sixes River - from the Pacific Ocean to head of tide.
- Elk River - from the Pacific Ocean to head of tide.
- Pistol River - from the Pacific Ocean to head of tide.
- Chetco River - from the Pacific Ocean to head of tide.
- Winchuck River - from the Pacific Ocean to head of tide.

The following lakes within the planning area have been determined to be navigable:

- Woahink
- Clear
- Siltcoos or Tsiltcoos
- Tenmile and North Tenmile
- Tahkenitch or Fivemile
- Floras

Lakes for which navigability have not yet been determined include:

- Eel
- Loon

- Garrison
- Threemile

The state could, in the future, assert claims to other waterways, based on navigability.

The BLM would work with the state to accommodate the state's 5,202.29 acres of in-lieu land entitlement with Public Domain land.

Withdrawals and Classifications

Withdrawals on the district are listed in Appendix P.

Classifications on the district are shown in Appendix Q, Table Q-1. Withdrawals generally segregate lands from operation under the non-discretionary general land laws, mining laws, and sometimes the mineral leasing laws but do not always necessarily affect BLM surface management. Classifications generally segregate the lands from all forms of appropriation under the public land laws, including the mining laws but not the mineral leasing laws. All withdrawals existing in 1984 and subject to the review provisions of FLPMA 204. (I) have been reviewed and recommendations for continuance, termination or reduction in size have been forwarded to the Oregon State Office for determination of appropriate action. All powersite classification withdrawals and designations and water power designations are scheduled to be reviewed under the authority of Departmental Manual 516 during the 1990s. Applications, relinquishments, and proposed withdrawals pending withdrawal petition are displayed in Appendix Q, Tables Q-2, Q-3, Q-4, Q-5, and Q-6.

New proposals for acquisition and development of special concern areas are expected over the next decade. Withdrawals should be considered whenever existing regulations do not adequately provide protection of resources or improvements, or whenever additional lands are acquired to create or enlarge special concern areas.

Right-of-Way Corridors, Major Rights-of-Way and Leases

Existing right-of-way corridors include Bonneville Power Administration and private utility transmission lines as shown on Map 2-2. The Western Regional Corridor Study of December 1986 did not identify any potential new corridors that would affect BLM-administered lands in the district. The future upgrading of existing transmission lines, however, is considered likely and may require additional right-of-way width.

There is one undeveloped right-of-way grant (OR 37851) for a Federal Energy Regulatory Commission hydroelectric project in the planning area, indicating potential development of one stream with a dam, diversion and other structures to generate power. This grant involves Mill Creek in Douglas County.

Low summer streamflow caused by lack of snowpack in the Coast Range makes hydroelectric generation marginal. To date, solar and wind power electrical generation has not occurred on public land. Advances in technology during this planning period could increase interest in the public lands for developing these alternative energy resources.

There may be a potential need for a natural gas pipeline from the Willamette Valley/Interstate Highway 5 corridor area to the Coos Bay/North Bend area to service a number of major industrial users. Importing nickel ore from New Caledonia (a South Pacific island) and construction of a drying facility is one such potential use. Construction of a pipeline may require a right-of-way crossing on portions of BLM-administered lands.

Additional rights-of-way have been granted to provide for construction of logging roads; driveways and utility lines for servicing residences; domestic and irrigation water pipelines; and legal ingress and egress. Many of these grants are within or adjacent to road clearing limits.

Because public and private lands are intermingled within the district boundaries, access for such activities as timber harvest includes crossing each other's land. Throughout most of the district, access has been accomplished through Reciprocal Logging Road Right-of-Way Agreements with neighboring private landowners. The individual agreements and associated permits are subject to the regulations in effect when the agreements or permits were executed or assigned. Appendix Q, Table Q-5 displays the 38 reciprocal right-of-way agreements in 1993 on the district.

Communication Sites

Nine existing communication sites are located in the district (see Map 2-2). All are developed sites, each having numerous users. The types of users on existing sites utilize two-way, microwave and low power relays which are generally compatible. Mass media users with associated high power transmissions, however, are usually not compatible with existing uses on these developed sites. It is highly probable that this incompatibility may warrant the need for additional sites in the future to accommodate high power users and to satisfy the expected demand resulting from new technology (e.g., satellite communications and cellular mobile). Although additional communication sites have not yet been identified, the higher elevation areas are probable sites for their placement.

Roads

In support of the timber management program, an average of 24 miles of road have been constructed, 14 miles reconstructed and 466 miles maintained each of the past five years. Table 3-2 displays the current inventory of BLM-controlled roads. Existing roads occupy approximately 10,300 acres. These roads, along with some easements and/or reciprocal right-of-way agreements, provide physical access to approximately 90 percent of district lands for resource management. The district has also developed 110 man-made structures or access points in streams and rivers to provide water for the prescribed fire program, wild fire suppression, or road construction and maintenance operations.

According to the functional classifications of roads defined in the Federal Highway Administration manual "Highway Functional Classification Concepts, Criteria and Procedures," BLM-controlled roads in the district are within three categories: arterial, collector, or local.

Table 3-2. Current Road Inventory of BLM-Controlled Roads

Surface Type	Functional Classification (In miles) Arterial	Collector	Local	Standard Single Lane	Double Lane
Natural Surface	0	64.54	209.01	276.55	0
Not Classified	0	0	0.2	0.2	0
Pit Run Surface	1.38	8.2	9.02	18.6	0
Crushed Sandstone Coarse	0	29.05	59.79	88.84	0
Aggregate Base Coarse-Crushed	2.33	9.06	21.07	33.09	0
Aggregate Surface Coarse-crushed	30.71	550.31	345.86	959.97	0
Bituminous Surface Treatment	355.01	38.73	5.77	399.51	32.4
Total Miles	**389.43**	**699.89**	**650.72**	**1,776.76**	**32.4**

Data as of 1994.

Arterial roads provide service to large land areas and usually connect with public highways or other arterial roads to form an integrated network of primary travel routes. Their location and standard are often determined by a demand for maximum mobility and travel efficiency rather than specific resource management. They are usually developed and operated for long-term land and resource management purposes and constant service.

Collector roads serve smaller land areas and are usually connected to an arterial or public highway. They collect traffic from local roads or terminal facilities. Their location and standard are influenced by long-term multi-resource management needs and travel efficiency. Collector roads may be operated for either constant or intermittent service, depending on land use and resource management objectives for the area served by the roads.

Local roads connect terminal facilities with collector or arterial roads, or public highways. Their location and standard are usually determined by the need to serve a specific resource activity or project, rather than travel efficiency. Local roads may be developed and operated for either long-or short-term service.

Air Resources

The Clean Air Act

The federal Clean Air Act, as amended in 1990, is designed to reduce air pollution, protect human health, and preserve the nation's air resources. To protect air quality, the Clean Air Act (Section 118) requires federal agencies to comply with all federal, state and local requirements for air pollution control and abatement.

Several federal air quality programs under the Clean Air Act regulate prescribed burning and other activities. For example, the National Ambient Air Quality Standards (NAAQS) are set to protect human health and welfare. Pollutant concentrations that exceed the NAAQS endanger public health. Air pollutants that have established federal NAAQS are called "criteria" air pollutants. They include particulate matter (PM 10), sulfur and nitrogen dioxides, ozone, carbon monoxide and lead.

State Implementation Plans

The Clean Air Act requires each state to develop, adopt, and implement a State Implementation Plan (sometimes referred to as a SIP) to ensure that the NAAQS are attained and maintained for the criteria pollutants. These plans must contain schedules for developing and implementing air quality programs and regulations. State Implementation Plans also contain additional regulations for areas that are in violation of one or more of the NAAQS. These areas are called "nonattainment areas." If a state fails to submit a State Implementation Plan or to adhere to the specified schedules of their SIP, the Environmental Protection Agency has the authority to impose federal sanctions or federal implementation plans.

The Oregon Smoke Management Plan (OSMP), a part of the required State Implementation Plan, identifies strategies for minimizing the impacts of smoke from prescribed burning on the densely-populated, designated, nonattainment and smoke sensitive areas within western Oregon and the Bend area in central Oregon (see Map 3-1). Particulate matter with a nominal size of 10 microns or less (PM 10) is the specific pollutant addressed in the State Implementation Plans.

The State of Oregon Department of Environmental Quality has a State Implementation Plan that has been approved by the Environmental Protection Agency. Besides addressing the criteria pollutants emitted from prescribed burning (e.g., PM 10), the Oregon state SIP also addresses visibility and smoke management.

Prevention of Significant Deterioration (PSD) and Visibility Programs

The Clean Air Act established the Prevention of Significant Deterioration Program to prevent areas that currently have clean air from being degraded. This program defines three area classifications based on air quality: Class I, Class II, and Class III. Class I areas are subject to the most limiting restrictions regarding how much additional pollution can be added to the air while still protecting air quality. All National Parks and some Wildernesses within the planning area are designated Class I. All lands administered by the Forest Service and Bureau of Land Management within this planning area are Class II. There are no Class III areas within the planning area.

The Visibility Improvement Plan, which is also part of the State Implementation Plans, considers the impacts that smoke from prescribed fire may have on visibility within the Class I areas designated as Wilderness. These Class I areas are shown on Map 3-1, as are wilderness areas that are now designated Class II but potentially may be designated Class I in the future.

A national goal of the Clean Air Act is to set the protection of visibility in Class I areas. The Visibility Protection Program provides for remedying existing impairment to visibility and preventing future incidences.

Air Quality Related Values (AQRVs)

The Clean Air Act (Section 165.d) gives federal land managers of Wildernesses (Class I areas) the affirmative responsibility to protect Air Quality Related Values from adverse impacts of air pollution. Values that must be protected within Class I areas include visibility, biological diversity, and water quality.

Air Quality Programs and Prescribed Fire

State and local governments have the authority to adopt their own air quality rules and regulations. These rules can be incorporated into the State Implementation Plan if they are equal to, or more protective than, federal requirements. For example, some states have incorporated smoke management provisions for prescribed burning into their plans.

Conformity

The conformity provisions of the Clean Air Act (Section 176.c) prohibit federal agencies from taking any action that causes or contributes to a new violation of the NAAQS, increases the frequency or severity of an existing violation, or delays the timely attainment of a standard. Specifically, federal agencies must ensure that their actions conform to the applicable State Implementation Plan. Required criteria and procedures for demonstrating and ensuring conformity of federal actions to a State Implementation Plan were finalized by the Environmental Protection Agency on November 30, 1993 (58 FR 63214). Because prescribed fire emissions affect air quality, conformity determinations must be made at the watershed, landscape and project/site-specific analyses levels.

Health and Welfare Effects of Prescribed Burning Pollutants

Criteria pollutants emitted from or formed as a result of prescribed fire include PM 10, oxides of sulfur and nitrogen, carbon monoxide and ozone. There are varying health effects associated with exposure to criteria pollutant levels greater than the NAAQS. The effects include lung damage, a reduction of the blood's ability to carry oxygen, eye irritation, chest pain, nausea, and an increased respiration rate. In terms of effects other than on human health (termed welfare effects), recent studies indicate that some aspects of forest health are adversely affected by several criteria pollutants produced by fire.

Many other noncriteria, but potentially toxic, pollutants are emitted by prescribed fire, including polynuclear aromatic hydrocarbons (sometimes referred to as PAHs) and aldehydes. There are varying effects from exposure to combustion emissions of these pollutants. Some PAHs are either known or potential carcinogens; other components, such as aldehydes, are acute irritants. Many of these air toxins dissipate or bind with other chemicals soon after release, making it difficult to estimate human exposure and consequential health effects. Additional research is necessary to determine the human health and welfare effects of air toxins released by prescribed burning or wildfires.

Focus on PM 10 (Particulate Matter Smaller Than 10 Micrometers)

PM 10 is a term used to describe airborne solid and liquid particles that are 10 micrometers or smaller in size. Because of its small size, PM 10 readily lodges in the lungs, thus increasing levels of respiratory infections, cardiac disease, bronchitis, asthma, pneumonia, and emphysema. The Environmental Protection Agency is considering a more stringent NAAQS for PM 10 because recent studies indicate that the current NAAQS may not be adequate to protect individuals with a greater sensitivity to these particulates. Typical sources of PM 10 include industrial processes, woodstoves, roads, agricultural practices, prescribed fires, and wildfires.

The air quality analysis in this EIS focuses primarily on the impacts of particulate matter from prescribed burning. Particulate matter (PM 10) is of the most interest because of its large quantities emitted from fires, its potential contribution from prescribed fires and wildfires to pollutant concentrations above the PM 10 standard, its capability to reduce visibility, and its role as a carrier of other toxic pollutants.

The population centers of Eugene/Springfield, Grants Pass, Klamath Falls, LaGrande, Medford/Ashland, and Oakridge are currently in violation of the national ambient air quality standards for PM 10 and are classified as nonattainment areas for this pollutant.

The nonattainment status of these communities is not attributable primarily to prescribed burning. For example, less than four percent of the annual total amount of particulate matter from prescribed fire is attributed to the nonattainment status for the Eugene/Springfield air quality management area. A major source of particulate matter within the Eugene/Springfield nonattainment area is smoke from woodstoves, and dust and industrial sources are other contributors. Because of concern about emissions from woodstoves, this airshed was recently placed under regulated use of woodstoves and fireplaces.

The cities of Coos Bay/North Bend and Roseburg are designated areas in the Smoke Management Plan and as such will be smoke avoidance areas when conducting district-prescribed fire activities.

Two other sources of pollution are directly attributable to land management activities: fugitive dust and aerosol herbicides.

The pollutant most associated with the Coos Bay District resource management activities is PM 10 found in smoke produced by forest land prescribed fire and woodstoves. Prescribed fire is used for site preparation, fuel hazard reduction, vegetation control, and to mimic natural disturbance processes.

Meteorological Factors

Weather patterns strongly influence air quality and smoke management by controlling the dispersion of fire emissions. The primary weather conditions that affect dispersion are atmospheric stability, mixing height, and transport wind speed. Atmospheric stability refers to the tendency for air to mix vertically through the atmosphere. Mixing height is the vertical distance through which air is able to mix. Transport wind speed is a measure of the ability of air to carry emissions away from a source horizontally. These three factors determine the ability of the atmosphere to disperse and dilute emissions that are released from prescribed fires and wildfires.

Another factor that influences emission dispersions is the physiography, or physical shape, of landscapes that interacts with and controls some weather patterns. Many interior basins of the Pacific Northwest (e.g., the Willamette Trough and many southwest Oregon river valleys) can trap emissions during periods when the atmosphere is relatively stable and winds are light. Because these basins have a shallow mixing height, pollutants may accumulate near the ground. This atmospheric condition is most likely to occur between November and March, which are times when little underburning or broadcast burning occurs. During the remainder of the year in these physiographic provinces and in other physiographic provinces that have higher mixing heights, prescribed burning is conducted when transport winds are not expected to carry emissions to smoke-sensitive areas in quantities that affect Prevention of Significant Deterioration increments and visibility. Furthermore, prescribed burning activities are coordinated with state and local air quality agencies to ensure that atmospheric stability and mixing heights are advantageous for dispersion.

Recent Prescribed Fire Use and Emissions

Prescribed fire use was analyzed to assess the effect on air quality of implementing the alternatives in this EIS. The years 1985 through 1992 were analyzed because prescribed fire use trends for this period were representative of recent forest management practices, and because data quality was reasonably good. Detailed reporting of prescribed fire statistics is required in the Oregon Smoke Management Plan.

Prescribed burning during the mid-to-late 1980s reflects a large amount of burning to dispose of harvest residues (usually called slash burning). Prescribed burning objectives during this period were to reduce wildfire hazard, prepare harvested areas for planting, and reduce vegetative and moisture competition from undesired vegetation species. Ecosystem management was not considered to be an objective during this period. Very little (less than 10 percent) of the burning that occurred from 1985 to 1992 was for ecosystem management purposes. From 1990 to 1992, the acreage requiring prescribed burning for slash disposal and site preparation was reduced due to decreased timber harvest levels. There was increased acreage burned during the 1990-1992 period, when compared to the 1976-1979 baseline. In the early 1990s, however, the acreage harvested and the resulting PM 10 tonnage decreased through the use of emission reduction techniques.

The goal is to reduce particulate matter emissions from forest land prescribed burning by 50 percent for all of western Oregon by the year 2000. Current data indicates particulate emissions have already been reduced by approximately 42 percent since the baseline period was established (ODF 1991). This trend is expected to continue, and prescribed fire smoke emissions will not be a consideration in meeting air quality standards for PM 10 in western Oregon.

A primary reason for the emission reduction levels from the calculated baseline period of 1976 to 1979 is the decrease in the total tons per acre consumed (see Table 3-3). For the planning area, the average annual prescribed fire fuels consumption rate per acre during the baseline period was approximately

Table 3-3. Biomass Consumption Estimates

Category	Calculated Baseline[1] Average Consumption (1976-1979)			Calculated Baseline[2] Average Consumption (1984)			Adjusted Coos Bay District[3] Average Consumption (1985-1988)		
	High	Mid (tons per acre)	Low	High	Mid (tons per acre)	Low	High	Mid (tons per acre)	Low
Duff [4]	32.3	29.3	26.4	30.0	21.3	15.0	18.0	10.8	7.2
Woody <3"	12.3	12.3	12.3	13.2	9.5	6.7	15.9	11.5	8.0
Woody >3"	16.3	16.0	15.7	14.5	11.0	8.2	16.6	10.6	5.3
Rotten	2.7	2.7	2.6	2.5	2.2	1.9	2.5	2.2	1.9
Total	**63.6**	**60.3**	**57.1**	**60.2**	**44.0**	**31.8**	**53.0**	**35.1**	**22.4**

[1] Westside baseline assumed total comsumption of all fuel tonnage reported. Burning was done mostly in the fall when moistures were low and consumption was high.

[2] Calculation reflects lower consumption based on more spring burning rather than fall. Fuel moistures were high when burning was done, decreasing consumption.

[3] Based on current fuels inventory information.

[4] Figures for an average forest duff layer of 4 inches can be modified to match the district's conditions of 0.6 inches of duff (e.g., for 2-inch duff depth, reduce figures by 50 percent).

Source: Sandberg et al. 1985

64 tons per acre from approximately 1,900 acres. There were few prescribed fires prior to 1979 in the planning areas. From 1980 to 1984, the consumption rate was 44 tons per acre from an average of 2,300 acres. The present consumption rate, as represented by the period 1985 to 1988, is 35 tons per acre from an average of 3,000 acres. This reduction in total tons consumed has a direct proportional effect on the amount of PM 10 produced.

When burning under springlike conditions, larger fuels are not consumed due to higher fuel moisture. Fuel consumption is lower, creating fewer emissions, with smoke dispersal easier to achieve under the general meteorological conditions that prevail at this time.

The use of advanced ignition techniques, such as rapid ignition, further reduces total emissions by reducing the total combustion process—in particular the smoldering stage. It also reduces emissions by accommodating burning under wetter fuel conditions, which allows less material to be burned—especially the soil-protecting duff layer.

Prescribed Burning Air Quality Impacts

The air quality impact of prescribed burning during the 1985 to 1992 time period is difficult to quantify. While burning forest residues can create large quantities of particulate matter and other pollutants, this burning usually takes place in relatively remote areas with intensities that vent smoke high into the atmosphere where it is widely dispersed.

Historically, burning too late in the day, burning too many timber harvest units too close together, and inaccurate wind direction forecasts allow residual smoke to flow into a designated area. As one indicator of smoke impacts, Oregon Department of Forestry tracks smoke intrusions into designated areas (primarily population centers). An intrusion is defined as smoke from prescribed burning entering a designated area at ground level. Intrusions are classified from light to heavy. From 1987 to 1989, an average of 25 intrusions occurred per year in western Oregon. These intrusions were generally light to moderate in intensity and of short duration (ODF 1991). Intrusions do not necessarily violate air quality standards, although they may cause public nuisances. The 1992 Oregon Smoke Management Annual Report displays the trend in intrusions over the 1985 to 1992 period. Table 3-4 lists the number of smoke intrusions attributed to forest management activities in the Coos Bay District. Because only smoke intrusions into designated areas are reported, however, potential impacts in very small towns or rural areas close to forest lands may be overlooked.

The increased use of fire for ecosystem management may increase the number of intrusions per year. Intrusions may be particularly problematic with underburning due to the difficulty of venting smoke into the upper atmosphere because of the low-intensity burning required to protect the residual stand.

The 1991 and 1992 Oregon Smoke Management Annual Reports also report PM 10 violations. The Oregon Department of Forestry analyzed burning and weather conditions for the dates of violations and concluded that forestry-related burning did not contribute to any violation in either year.

Prescribed burning can adversely impact visibility in Class I areas where excellent air quality is an important value. Special remote-area monitoring in Oregon between 1982 and 1984 showed that prescribed burning contributed 48 percent of the particulate pollution at one Class I monitoring site and 41 percent at another, demonstrating that impacts can be significant. Prescribed fire use under any of the alternatives should follow state visibility requirements to minimize impacts. Whether prescribed natural fire from unplanned ignitions should be restricted for visibility protection is still under discussion by air quality agencies.

Hand and machine piling, and swamper burning of slash has allowed selective burning of woody debris during late fall and winter, but only under weather conditions that allow optimal smoke dispersion. Burning of properly piled material is generally a more efficient method of combustion, and allows for scheduling of burning when snow and adjacent water-saturated fuels reduce the risk of escaped fires.

Alternatives to burning have helped reduce emissions. These include removal of heavy boles and large limbs for use as secondary wood products, power generation, and firewood.

Not all timber harvest units require treatment by prescribed fire. Between 1984 and 1992, 74 percent of the total average annual slash acres created by timber harvest activities in the planning area were actually treated with some form of prescribed burning (see Table 3-5).

Table 3-4. Smoke Intrusions in Coos Bay and Roseburg Designated Areas from Coos Bay BLM Management Activities (1984-1992)

	Number of Smoke Intrusions		
Year	Total	BLM	Days
1984	0	0	0
1985	0	0	0
1986	1	1	1
1987	2	2	2
1988	3	2	3
1989	0	0	0
1990	0	0	0
1991	0	0	0
1992	0	0	0

Source: Oregon State Dept. of Forestry Annual Smoke Management Reports

Table 3-5. Prescribed Fire Use Based on Total Available Harvest Acres

Year	Harvest Acres	Prescribed Fire Acres	Percent of Total
1984	3,162	2,344	74
1985	3,686	2,305	63
1986	4,973	2,942	59
1987	4,680	3,502	75
1988	6,696	3,581	53
1989	5,240	4,711	89
1990	3,767	3,470	92
1991	2,540	2,670	105
1992	1,855	1,721	93
Total	**36,599**	**27,246**	**74**

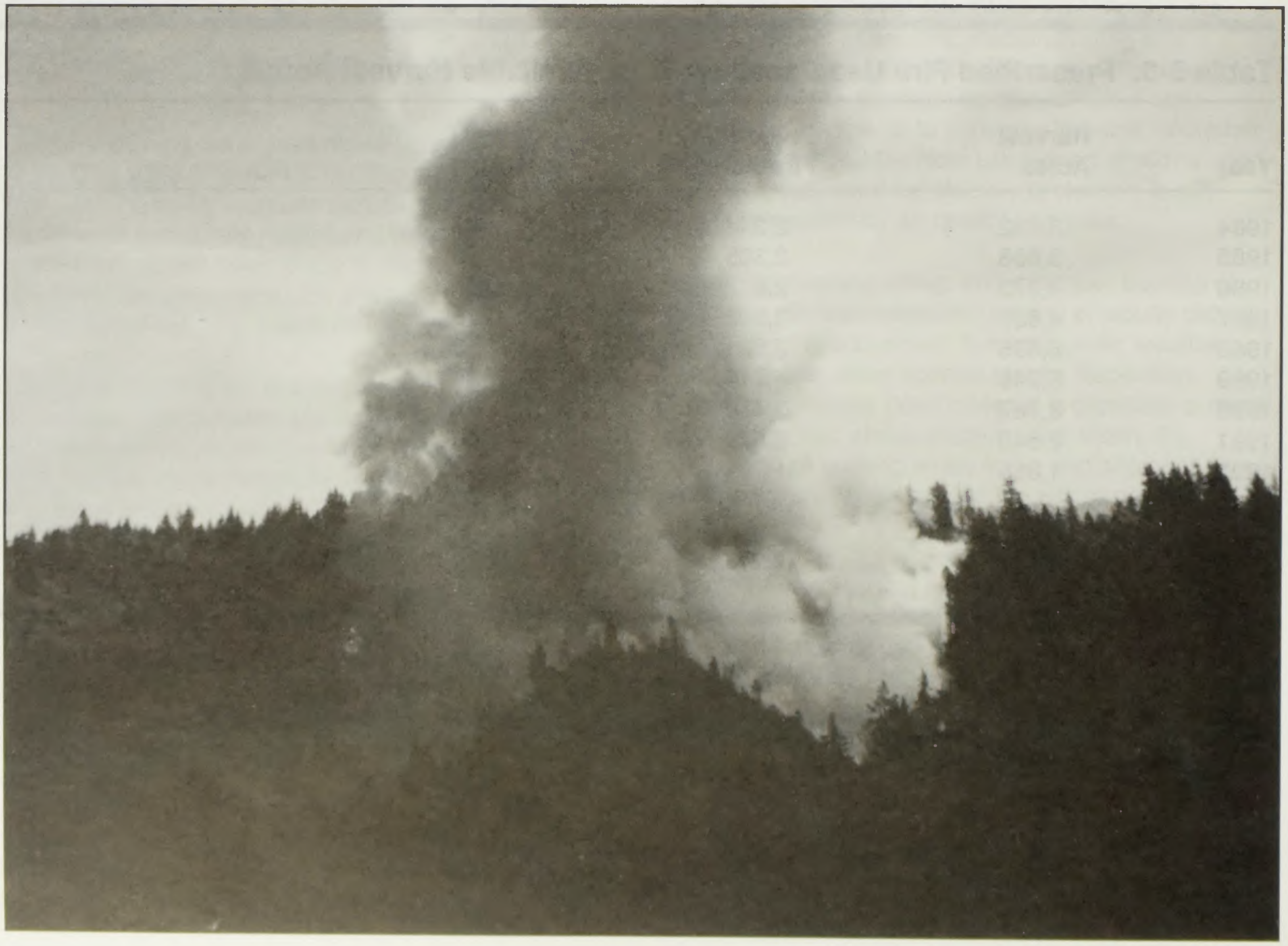
In some instances, the concern for smoke impacts restricts site preparation to mechanical or physical methods. No treatment or mechanical treatment, however, does not necessarily reduce the amount of available fuel and could result in a higher fuel hazard and increased risk of wildfire.

Emissions from wildfires are significantly higher than from prescribed burning. For example, the wildfires in southern Oregon in 1987 emitted as much particulate matter as the total burning that occurred within the state that year.

Air quality impacts from wood heating in residential areas are different than those associated with prescribed burning of logging slash. Most of the wood that is burned as firewood comes from the surrounding forest land. As a consequence, air quality impacts shift from generally higher elevations, which are more favorable to smoke dispersion and remote from other air pollution sources, to lower elevations with less air movement and in closer proximity to other pollution sources. Emissions from woodstoves contribute to both health and visibility concerns. Smoke particles emitted from incomplete combustion of wood may have relatively high concentrations of known and suspected carcinogens.

Winter air stagnation, which causes air pollution from woodstoves, is a problem in the Eugene/Springfield and Medford air quality management areas. The burning of firewood during the winter, when colder air and temperature inversions occur, traps and concentrates wood smoke in the valleys.

Between November 15 and February 15, city woodstove curtailment programs in Eugene/Springfield and Medford restrict woodstove use on days when air stagnation exceeds established standards. All prescribed burning during these yellow and red days must be above the valleys' inversion levels and not contribute to their air pollution levels. Temperature inversions that keep pollutants trapped within the valleys exclude prescribed smoke intrusions from above. The topography, airflow, and lower populations within the Coos Bay planning area are not conducive to air pollution from woodstoves.



Soil

Soil is a complex, highly variable layer of unconsolidated material composed of air, water, chemicals, gases, organic material, living organisms, and rock fragments. It is a fundamental component of the environment upon which all renewable resources of the Coos Bay District depend. The combined influences of time, parent material, climate, living organisms, and topography of a site have interacted to form soil with a unique set of characteristics. These characteristics determine the productive capacity of the soil and the management practices needed to maintain its productivity.

Quantity and quality of vegetative growth are measures of soil productivity. High productivity requires that the soil provide optimum moisture, aeration, nutrients, and anchorage. Many soil properties (including organic matter content and cycling rate, nutrient level, organisms, texture, structure, porosity, and depth) are important for vegetative growth. These properties are influenced by soil displacement, compaction, erosion, and organic matter removal, whether natural or human caused. In addition to providing a medium for plant growth, soils store and deliver water to streams and lakes.

Preservation of organic materials, including humus, is important in all soils, but especially in less productive soils where even a small loss can have a large effect on productivity. Harvest and site preparation methods and frequencies influence the amount and composition of the surface organic layer. Conservation of small materials (e.g., needles, leaves, and twigs) is particularly important as they contain the highest concentrations of nitrogen.

Removal of large materials (e.g., stemwood and branches), when compared with small materials, has less effect on total nitrogen. However, the large materials store water and also serve as a reservoir for mycorrhizae and soil organisms which are important in maintaining long-term productivity. Decomposition of large materials enhances soil quality by improving soil structure, increasing infiltration, and reducing erosion.

Soils information, including distribution and characteristics, has been collected by the Soil Conservation Service (SCS) and BLM soil scientists and is available at the Coos Bay District Office. Using data for soil, climate (temperature and precipitation), landform, vegetation, and geology, the SCS has mapped 12 major soil associations on the Coos Bay District.

An intensive inventory, the Timber Productivity Capability Classification (TPCC), provides site-specific information about land the district manages (see Timber Resources section). This inventory identifies fragile sites which, when harvested, could have reduced timber growing potential due to natural limiting soil properties and landform characteristics. The Coos Bay District subdivided the Fragile Gradient-Restricted (FGR) lands into two classes, FGR1 and FGR2, because of the large acreage of steep lands on the district.

The FGR1 lands are less steep and fragile than the FGR2, but this classification recognizes that some restrictions on management practices are needed to prevent potential losses of productivity. FGR2 lands, the most fragile of the commercial forest lands, require restrictive management practices to maintain their productivity. As an example, cable yarding of logs with partial or no suspension is usually acceptable on FGR1 lands. FGR2 lands, being steeper and more dissected with more shallow and rocky soils, require full and/or partial log suspension to minimize soil disturbance and potential soil productivity losses resulting from yarding logs. Some of the more important restrictive measures used to protect soil productivity on these fragile lands are shown in Appendix H, Best Management Practices (BMP). More detailed TPCC classification descriptions are contained in Oregon Handbook 5251-1, which includes the Coos Bay District Supplement.

Table 3-6 displays acres classified as “Fragile Nonsuitable Woodland” which are not considered to be commercial forest lands.

Table 3-7 displays forest lands subject to unacceptable soil productivity loss unless restrictive or mitigating practices are used (see BMPs, Appendix H).

Past, unmitigated management activities that have caused soil displacement and erosion, compaction, and organic matter removal could have adversely affected soil productivity. For example, approximately 1,740 miles of road construction on BLM-administered lands has resulted in approximately 10,300 acres of land being taken out of production. Acreage in roads and landings is considered an irreversible or irretrievable commitment of resources.

Table 3-6. Fragile Nonsuitable Woodland

Category	Acres	Percent of BLM Forest Land
Soil Moisture	340	0.1
Soil Nutrients	1,340	0.4
Slope Gradient	28,860	9.3
Mass Movement Potential	620	0.2
Surface Erosion Potential	20	<0.1
Ground Water	130	<0.1
Total	31,310	10.0

Table 3-7. Fragile Suitable, Restricted

Category	Acres	Percent of BLM Forest Land
Soil Moisture	4,860	1.6
Soil Nutrients	2,300	0.7
Slope Gradient		
FGR1	68,830	22.3
FGR2	87,220	28.2
Mass Movement Potential	4,190	1.3
Surface Erosion Potential	160	<0.1
Ground Water	250	<0.1
Total	167,810	54.3

Another management activity that is being monitored for its effect on soil productivity is slash burning.

During fiscal years 1987-90, ten percent of the slash-burned units monitored (2 of 20) had excessively hot burns; both were "summer burns" and caused unacceptable loss of organic materials, and possibly a negative impact on long-term productivity. Prior to the 1980s, while slash burns were typically hotter as carefully controlled burning prescriptions had not yet been fully developed and implemented, fewer acres were burned. Natural wildfires typically burn very hot because of extremely dry fuels and the hot, dry weather conditions of mid-to-late summer.

The current practice of removing large woody debris from harvested units to improve plantability, reduce burn intensities, reduce potential landslide impacts, or for wood chips also may affect soil productivity. Mycorrhizae and other soil organisms that have beneficial effects on productivity may have had their populations reduced by these activities and other factors. The impacts of cable yarding, especially conventional high lead, on long-term productivity have not been documented but are estimated to be considerably less than that of tractor yarding because cable systems create less soil displacement and compaction. All district soils, because of their physical composition, are assumed to be susceptible to soil compaction.

Since the late 1970s, a concern for long-term soil productivity has resulted in development of guidelines, standards, and protective measures to prevent loss of soil productivity from management activities. Soil protection policies exist for road construction, log yarding, burning, and other soil-disturbing activities. All timber sale contracts include stipulations that address TPCC restrictions and site-specific soil productivity concerns.

Activities that could adversely affect long-term soil productivity have been monitored since the mid-1980s. A representative sampling of the most fragile units harvested and broadcast burned are monitored, especially relative to the amount of fine organic materials consumed, to determine impacts of yarding and burning on soils. Analysis of management activities include estimations of their potential to cause soil compaction, erosion, and landslides.

Roads and landings are examined for stability, drainage, and success of erosion-reducing measures. Based on these observations, management activities were within pre-established threshold levels more than 90 percent of the time. (See Oregon State Office BLM Manual Supplement H-1734-1, Monitoring Western Oregon Records of Decision).

Water Resources

Introduction

The Federal Water Quality Act of 1987 directs federal agencies to comply with state water quality requirements to restore and maintain water quality necessary to protect identified beneficial uses. The state of Oregon has identified beneficial uses and applicable water quality criteria for the Mid-Coast (OAR 340-41-242 and 245), Umpqua (OAR 340-41-282 and 285), South Coast Basins (OAR 340-41-322 and 325 and Rogue Basin (OAR 340-41-362 and 365). Policy and guidelines, including those for antidegradation, generally applicable to all basins are listed in OAR 340-41-026(1)(A).

The beneficial uses of water resources of primary concern related to land management activities on the Coos Bay District are rearing and spawning habitat for salmonoids, domestic water supply, fishing, and water contact recreation. Maintenance of high quality water is important for all of these uses. See Table 3-8 for a comprehensive listing of beneficial water uses on selected analytical watersheds in the planning area.

See Appendix III-B of the draft RMP for a summary of forest hydrology relative to the transformation of precipitation to streamflow and/or ground water and the interrelationship to forest management practices.

Water Resources

The district has been divided, based upon topography and basin size, into 28 analytical watersheds to facilitate assessment of existing conditions and to analyze proposed management alternatives. The analytical watersheds vary in size from 22,000 to 297,000 acres, with an average of 72,000 acres. Logical boundaries were utilized to divide large basins into analytical watersheds. See Map 3-2.

Table 3-9 identifies analytical watersheds in the Coos Bay District where BLM administers 20 percent or more of the watershed. This table lists the acreage within each analytical watershed, the percent of BLM-administered land, and the miles of stream by order. For a complete listing of all analytical watersheds, see Appendix III-C of the draft RMP. Table 3-10 gives flow information, and Table 3-11 lists the BLM-administered lakes within the district. The miles of first and second order streams have been estimated based on a statistical analysis described in the FEMAT Report.

Estimates are that less than one percent of the average annual streamflow occurs during the months of August and September in many of the analytical watersheds, with corresponding seasonal streamflow shortages. This period of low flow occurs when agricultural use of surface water is high.

Ground water in the coastal area is a limited resource. With the exception of the dunes complex aquifer from Coos Bay to Tenmile Creek in the Coos Bay North and Lakeside Frontal analytical watersheds, there is a lack of baseline information available to adequately assess the current status of ground water quantity or quality. However, geologic conditions generally do not favor water accumulation. Ground water is a significant factor in the maintenance of natural lakes in the Coos Bay North and Lakeside Frontal analytical watersheds.

Ground water quality within the coastal areas is, in general, highly mineralized with concentrations of iron and manganese and of moderate hardness.

Domestic and irrigation water rights have been filed both on and downstream from BLM-administered lands; information on such rights is available from the local watermaster. Many streams have been fully appropriated during summer low flow periods. The list of community water systems on Table 3-12 is confined to those having watersheds located on BLM-administered lands. The location of the community watersheds is shown on Map 3-2. Neither of these community water systems, both of which have surface sources, have any known water quality problems.

Portions of 11 rivers within the Coos Bay BLM District have met eligibility criteria under the Wild and Scenic Rivers Act. At present, however, there are no designated "outstanding natural resource waters" on the district.

Stream Channel Conditions

Stream channel condition was assessed using a modification of the "Stream Reach Inventory and Channel Stability Evaluation" (Pfankuch 1978) procedure developed by the Forest Service. The purpose of this inventory is to evaluate the resistive capacity of mountain stream channels to change. Table 3-13 ranks stream stability by analytical

Table 3-8. Beneficial Uses By Analytical Watershed [1] - Umpqua and South Coast Basins

Beneficial Use	Lower Smith River	Loon Lake-Camp Creek	M. Umpqua Frontal	South Fork Coos	East Fork Coquille	Middle Fork Coquille	North Fork Coquille
Public Domestic Water Supply					X	X	X
Private Domestic Water Supply	X	X	X	X	X	X	X
Industrial Water Supply	X	X	X	X	X	X	X
Irrigation	X	X	X	X	X	X	X
Livestock Watering	X	X	X	X	X	X	X
Anadromous Fish Passage	X	X	X	X	X	X	X
Salmonoid Fish Rearing	X	X	X	X	X	X	X
Salmonoid Fish Spawning	X	X	X	X	X	X	X
Resident Fish & Aquatic Life	X	X	X	X	X	X	X
Wildlife and Hunting	X	X	X	X	X	X	X
Fishing	X	X	X	X	X	X	X
Boating	X	X	X	X	X		X
Water Contact Recreation	X	X	X	X	X	X	X
Aesthetic Quality	X	X	X				X
Hydro Power		X			X		
Commercial Navigation	X			X			

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[1] Includes only those watersheds where BLM administration is 20 percent or greater.

Table 3-9. Coos Bay District Analytical Watersheds [1]

Watershed Name	Analytical Watershed Acreage	% BLM	Stream Order	Total Stream Miles [2]	BLM Stream Miles
Lower Smith River	187,681	34	1 & 2	1,002	330
			3	130	49
			4	82	32
			5	39	12
			6+	63	16
Loon Lake-Camp Creek	84,652	29	1 & 2	313	127
			3	56	23
			4	25	7
			5	22	5
			6+	19	1
Middle Umpqua Frontal	51,593	32	1 & 2	284	70
			3	36	12
			4	19	4
			5	13	2
			6+	37	0
South Fork Coos	158,066	20	1 & 2	955	239
			3	128	32
			4	63	17
			5	27	4
			6+	56	8
East Fork Coquille	84,824	55	1 & 2	768	393
			3	108	55
			4	52	30
			5	31	15
			6+	40	9
Middle Fork Coquille	197,858	32	1 & 2	1,463	388
			3	219	60
			4	103	23
			5	72	12
			6+	47	4
North Fork Coquille	102,194	37	1 & 2	680	221
			3	115	38
			4	58	18
			5	27	6
			6+	63	8

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[1] Includes only those where BLM administration is 20 percent or greater. For other analytical watersheds within the planning area, see Appendix III-C of the draft RMP.

[2] Mileage for stream orders 1 and 2 are estimates.

Table 3-10. Water Yield of District Watersheds

Watershed	Average Annual[1] Precip.	Annual Yield[2] (inches)	Average Annual Flow[2] (cfs)	Average Minimum Flow[2] (cfs)	25-Yr. Flood[3] (cfs)
Smith River	85	50	1,075	33	42,185
Loon Lake-Camp Creek	80	50	618	15	12,257
Middle Umpqua Frontal	80	63	376	9	12,760
South Fork Coos	90	69	1,285	25	48,356
East Fork Coquille	75	40	401	34	16,409
Middle Fork Coquille	65	33	750	26	20,430
North Fork Coquille	70	54	632	33	19,487

cfs = cubic feet per second

Sources:

[1] Oregon State University 1982

[2] US Geological Survey, 1990; Oregon Water Resources Dept., 1958, 1963

[3] Butler 1986

Table 3-11. Lakes Within Coos Bay District

Watershed	Lakes	Size (acres)	Use
Loon Lake-Camp Creek	Loon Lake	294	Recreation
Lower Smith River	Wassen Lake	5	Recreation

Table 3-12. Community Water Systems

Watershed	System Name	Residences Served	Filtered (Y or N)	Watershed Area (Acres) BLM	Other	Total
North Fork Coquille	City of Myrtle Point	1,100	Y	83,865	103,153	187,018
Coquille	City of Coquille	1,800	Y	157,931	453,113	611,044

Table 3-13. Relative Stream Channel Stability in Analytical Watersheds

Watershed	Rating [1]
Lower Smith River	-
Lower Umpqua Frontal	-
Loon Lake-Camp Creek	-
Middle Umpqua Frontal	-
Siltcoos Frontal	0
Lakeside Frontal	0
Coos Bay North	0
Coos Bay South	0
Millicoma River	-
South Fork Coos	-
Lower Coquille	-
Middle Main Coquille	-
South Fork Coquille	0
East Fork Coquille	0
Middle Fork Coquille	-
North Fork Coquille	0
New River Frontal	-
Sixes River	+
Elk River	+
Humbug-Nesika Frontal	+
Lower Rogue	+
Lower Illinois	+
Hunter Creek	0
Pistol River	+
Cape Ferrelo Frontal	0
Chetco River	0
Winchuck River	0
California Smith River	0

Abbreviations used in this table:

[1] + = More stable than the district average
0 = Approximately as stable as the district average
- = Less stable than the district average

watershed according to existing stream inventories. Since stream channel data was not available from private ownerships, adjustments to the relative stream channel stability relied upon resource specialist observation.

The condition of a stream channel has a significant effect on downstream water quality parameters and various beneficial uses. Because of the variety of beneficial uses within each analytical watershed, as shown in Table 3-8, no one set of stream channel conditions is best. Certain conditions, however, that are usually indicators of a healthy stream environment for most uses include stable stream banks and bottoms, an abundance of stable large woody debris, and a healthy riparian ecosystem.

The effects of the riparian ecosystem on water resources are described in the Riparian section of this chapter.

Two types of events that have adversely affected stream channels are debris torrents and splash dams. Debris torrents from landslides have scoured some stream channels down to bedrock and destroyed much of the riparian vegetation.

The use of splash dams during the beginning of this century to transport logs consisted of building a dam on a stream. During a storm, the dam was broken sending tons of logs downstream and scouring out the stream channel. Many streams have not recovered from the use of splash dams. Table 3-14 lists some streams known to be in poor condition as a result of splash dams or debris torrents.

A major fire, the Oxbow Burn of 1966, left portions of the Lower Smith River analytical watershed in an unvegetated condition susceptible to erosion and mass movement. In subsequent winters, debris torrents scoured portions of Grunt, Marsh, Halfway, Mosetown, Argue, Big, Slide, Scare, and North and South Sisters Creeks. Torrent effects on these stream channels are still evident today.

The importance of large woody debris to the proper functioning of streams and rivers cannot be overstated. Besides providing habitat for aquatic organisms, this material regulates flow (reducing floods), increases low flows (preventing erosion), and traps sediment. Because the policy from 1970 until the mid-1980s was to remove woody debris from streams, many streams in all watersheds are lacking adequate large woody debris.

Placer mining, another source of significant impact to stream channels, is not a factor in the Coos Bay District since there are no placer mining permits issued.

Upland Conditions

Portions of the Smith, Umpqua, Coos and Coquille watersheds have a high landslide potential due to heavy rainfall and steep, highly-dissected terrain. Such topography makes these areas particularly sensitive to activity. Intensive inventories and mitigative management practices have been done on the areas with high landslide potential.

Forest management activities (especially those that cause soil disturbance and vegetative alterations such as logging and road building) can cause changes in streamflows which in turn can change sediment rates (see Appendix III-B of the draft RMP).

Water Quality Conditions

In 1988, the Oregon State Department of Environmental Quality (DEQ) conducted an extensive inventory of water quality problems in the state and published the results in a Non-point Pollution Assessment Report. Data specific to water quality problems in the Coos Bay District was extracted from that report. (See Appendix III-D, Table III-D-1 of the draft RMP). According to that report, ten streams have been designated as A1, which is a reflection of severe impairment of one or more beneficial uses. Nine streams have A2 ratings indicating there are conflicting reports on water quality and beneficial use impairment that have yet to be resolved. No streams have been designated as B where a moderate impairment of one or more beneficial uses was reported.

Streams or other water bodies that have particularly persistent water quality problems or impairment of numerous beneficial uses are required to have levels set designating total maximum daily loads (TMDL) of pollutants. These TMDLs are the maximum amount of pollution a particular water body can absorb in a day without exceeding established water quality standards, thereby becoming unhealthy or unusable for some beneficial use. TMDLs and other limits on water pollution are essentially limits on human activities in a watershed. This means that setting TMDLs can force reductions in, or even moratoriums on, home building, road construction, timber and crop harvesting, industrial development, as well as other activities in the affected watershed. Water quality limited streams, or streams requiring TMDLs, are identified in the 1992 Water Quality Status

Table 3-14. Scoured Streams

Stream Name	Stream Order	Analytical Watershed	Cause[1]	Date	Miles
Smith River	7	Lower Smith River	S	1917-1925	68.0[2]
Johnson Creek	2	Lower Smith River	D	1978-83[3]	1.0
Spencer Creek	2	Lower Smith River	D	1978-83[3]	1.0
Fitzpatrick Creek	2	Middle Umpqua Frontal	D	1978-83[3]	0.5
South Fork Coos River	7	South Fork Coos	S	1940-57	31.0[2]
Fruin Creek	2	South Fork Coos	D	1978-83	1.5
Cox Creek	2	South Fork Coos	D	1978-83	0.5
Wren Smith Creek	2	South Fork Coos	D	1978-83	0.5
Coal Creek	2	South Fork Coos	D	1978-83	0.75
North Fork Coquille River	7	North Fork Coquille	S	1898-1948	53.0[2]
Middle Creek	6	North Fork Coquille	S	1912	10.0[2]
East Fork Coquille River	7	East Fork Coquille	S	1905-48	34.0[2]
West Fork Brummet Creek	5	East Fork Coquille	D	1950s[3]	2.0
Middle Fork Coquille River	7	Middle Fork Coquille	S	1901-39	40.0[2]
South Fork Coquille River	7	South Fork Coquille	S	1891-1903	63.0[2]
Bear Trap Creek	2	Humbug-Nesika Frontal	D	1978-83[3]	0.5

[1] Cause: D = Debris Torrent
S = Splash Dam (per Beckham 1990)

[2] Total stream miles; actual floatable distance for historic log drives may be somewhat less than shown.

[3] Occurrence of one or multiple debris torrents are within range of years given.

Assessment Report (305.b report). As of 1992, the Coquille River System has been identified by DEQ as water quality limited, and an intensive water quality assessment has been completed. The TDML on the river is currently in draft form. Limits or load allocations have been set on point sources of pollution; non-point sources are still under study (Oregon DEQ 1994). Elevated bacterial levels in the estuary, low summer dissolved oxygen concentrations, high water temperature, and sedimentation throughout the basin have been identified as major concerns.

Monitoring of water quality parameters has been conducted on eight streams in the Coos Bay District since 1981. Results in all cases have not been fully analyzed; however, some averages are available as shown in Table 3-15.

Watershed Condition

The general condition of a watershed refers to its ability to function in a way that will deliver high quality water, safely dissipate the effects of high streamflows, and provide sufficient storage to continue prolonged summer flows during the dry season. The entire watershed, including upland areas and tributary streams, influences downstream riparian and stream resources by controlling the amount of sediment, nutrients and thermally heated water that is delivered and routed, and by affecting the amount and timing of streamflow. Certain requirements are generally accepted as necessary for proper functioning of uplands. These include geology, landform and drainage patterns, type, density and structure of vegetation, distribution and amount of stable soil types, and effects of disturbance. Healthy riparian-wetlands and streams are characterized by streamflow energy in balance with channel processes with geomorphic, hydrologic, vegetation, and soils factors providing structural resistance. Normal floodflows are conveyed safely downstream, low flows are maintained, stream channels are stable and shaded, and high water quality is maintained.

Watershed condition for the selected analytical watersheds is explained below. Evaluation was limited to those watersheds where BLM management could show an effect on upland, riparian and stream processes. Analytical watersheds are grouped by State basin and identify key concerns.

Selected analytical watersheds in the Umpqua basin in portions of Lane, Douglas, and Coos counties are: Lower Smith River, Middle Umpqua Frontal, and Loon Lake-Camp Creek. These watersheds are in poor condition, and the worst overall condition of any group in the district.

Key concerns in this grouping of watersheds are:

- Very high percentage of most of these watersheds with steep critical slopes, erodible soils, and mapped unstable soils.
- High amount of these watersheds with streamside riparian zones that are predominately young timber, brush or other openings. The lack of established riparian vegetation does not provide erosion protection, shading, and streambank stability and structure for current and future aquatic needs.
- High amount of burning, herbicide use, fertilization and precommercial thinning in the Lower Smith River watershed. These silvicultural practices can have some effect on water quality.
- High density of rocked\dirt roads and logging disturbances in the Middle Umpqua Frontal watershed. Roadbuilding, logging and other disturbances increase onsite soil loss, delivery to streams, and stream sedimentation.
- High acreage of the Middle Umpqua Frontal analytical watershed in meadows, pastures, brush, young forests, and areas with over 20 percent exposed soils. These conditions make the watershed highly susceptible to erosive forces in terms of rain splash, overland flow from roads and other compacted surfaces, and landsliding.
- Sand and gravel mining in the floodplain of the Umpqua River within the Middle Umpqua Frontal watershed. These operations can modify stream hydraulics, causing streambed\bank adjustments and sedimentation.

Selected analytical watersheds in the South Coast basin in portions of Coos and Douglas counties are: South Fork Coos, North Fork Coquille, East Fork Coquille and Middle Fork Coquille. The South Fork Coos analytical watershed is in poor condition, and the East and Middle Fork Coquille analytical watersheds are in fair condition. The North Fork Coquille analytical watershed is in fair to good condition overall.

Table 3-15. Surface Water Monitoring Results in the Coos Bay District

Watershed	Monitoring Station Name (Year Began)	Parameters Measured	Average Values
Smith River	North Sisters (1981)	Flow Temperature	44 cfs 48° F
	West Fork Smith (1982)	Flow Temperature	95 cfs 49° F
	Vincent Creek (1982)	Flow Temperature	121 cfs 49° F
North Fork Coquille River	Middle Creek (1984)	Flow Temperature	18 cfs 55° F
	Cherry Creek (1983)	Flow Temperature Turbidity Conductivity pH	24 cfs 51° F 0.5 NTU 62 µ 7.4 pH
East Fork Coquille River	Brummit Creek (1983)	Flow Temperature	1 cfs 52° F
South Fork Coos River	Priorli Creek (1984)	Flow Temperature Conductivity pH	1 cfs 50° F 71 µ 6.9 pH
	Tioga Creek (1984)	Flow Temperature	30 cfs 52° F

Abbreviations used in this table:
cfs= cubic feet per second
NTU = Nephelometric Turbidity Units
F = Farenheit
µ = Microseimens
pH= Measure of acidity

Source: District files

Key concerns in the South Fork Coos analytical watershed are:

- Very high percentage of mapped unstable soils.
- Very high percentage of critical slopes over 80 percent.
- High acreage of young forest age classes. This condition makes the watershed highly susceptible to erosive forces in terms of rain splash, overland flow from roads and other compacted surfaces, and landsliding.
- High amount of riparian zones that are predominately young timber, brush or other openings. The lack of established riparian vegetation does not provide adequate erosion protection, shading, and streambank stability or structure for current and future aquatic needs.

Key concerns in the North, East and Middle Fork Coquille analytical watersheds are:

- Very high percentage with mapped unstable soils.
- High drainage density, which indicates a high potential for erosion and stream sedimentation.
- High acreage of young forest age classes in the Middle and East Fork Coquille watersheds. This makes the watersheds susceptible to erosive forces in terms of rain splash, overland flow from roads and other compacted surfaces, and landsliding.
- High amount of the Middle Fork Coquille watershed with riparian zones that are predominantly young timber, brush or other openings. The lack of established riparian vegetation does not provide adequate erosion protection, shading, or streambank stability and structure for current and future aquatic needs.
- High density of rocked\dirt roads and other logging disturbances in the Middle Fork Coquille watershed. Roadbuilding, logging and other disturbances increase onsite soil loss, delivery to streams, and stream sedimentation.

Biological Diversity (including Forest/ Ecological Health)

Introduction

Biological diversity refers to the variety of life and its processes. It is primarily characterized in terms of the presence, abundance, and relative dominance of species and by the structural and spatial characteristics of habitats. In this document, the biological diversity of BLM-managed ecosystems is described in terms of the following components: genetic diversity, species diversity, landscape diversity, and ecosystem diversity (including structural and functional diversity). Emphasis is placed on characteristics of the plant community and the habitat it affords. See the Wildlife section for an expanded discussion of wildlife populations and the interactions between animals and habitat.

Ecological health, a closely allied concept, is defined in the *Forest Ecosystem Management: an Ecological, Economic, and Social Assessment Report of the Forest Ecosystem Management Assessment Team* (FEMAT) as "the state of an ecosystem in which processes and functions are adequate to maintain the diversity of biotic communities commensurate with those initially found there." Ecosystem diversity, expressed as the relative abundance and dominance of biotic elements within stands and landscapes, determines whether ecological processes are able to supply the resources and the habitats on which species survival depends.

The level of resiliency and stability in ecosystems is sometimes called "forest health." The discussion of functional diversity includes an estimate of the extent to which BLM ecosystems are stressed and are no longer stable or resilient and exhibit a diminished capacity to meet management objectives.

For most purposes, the best baseline for biological diversity analysis is the range of premanagement or historic conditions over which stand and landscape characteristics and ecological processes fluctuated. That range of natural fluctuation, however, is difficult to quantify and has changed over time with climate changes.

Various attempts have been made to characterize the range of pre-management or historic conditions, including work by Teensma, Rienstra, and Yeiter (1991) and Agee (1991). The most comprehensive attempt for Pacific Northwest forests is the Forest Service *Regional Ecosystem Assessment Project* (REAP) completed in June 1993 (USFS 1993). As far as possible, that project compared current characteristics of terrestrial and aquatic ecosystems with the estimated characteristics of those ecosystems during the period 1600 to the mid-1900s. The comparisons were presented by river basin and vegetation series. While the data base for estimation of premanagement conditions only includes Forest Service administered lands, REAP was used in this chapter, where possible, to compare current conditions on BLM-administered lands and across other ownerships with the probable range of historic conditions. Where REAP could not be used, other information, research data, and professional estimates were used to make this comparison. Comparisons have generally not been possible for riparian and aquatic conditions because of the lack of appropriate inventory data.

During the last 75 years, human activity has significantly changed the vegetative patterns of the planning area. The remaining forest lands have been particularly affected by fire suppression and logging. The history of logging, beginning in the early 20th century, has varied. In the planning area, approximately 60 percent of the Suitable Commercial Forest Land consists of young even-aged stands less than 60 years old which resulted from clearcutting or wildfires. Approximately 5 percent of the stands have had salvage operations conducted, and approximately 35 percent remain unentered.

The most striking changes have occurred within the last 30 to 50 years and include:

- Widespread changes in forest fragmentation. Fragmentation patterns differ within BLM-administered stands and within the entire managed landscape because of different management approaches on different ownerships.
- A decrease in the acreage of mature and old-growth, seral stands, with a corresponding increase in the acreage of early-, mid-, and late-seral stands. Early- and mid-seral stands resulting from logging operations generally have fewer snags and less structure than found in natural stands.

- Increases in stand density, fuel loading, fuel continuities, and fire hazard in stands that have not received regeneration harvests. Fire exclusion has led to an increase in fuel loading; development of dense underbrush; and increased presence, abundance and dominance of shade-tolerant climax species.

- Damage to the riparian vegetation and associated aquatic habitat in many watersheds.

A comparison of current forest condition with the probable range of historic condition is shown in Table 3-16. Comparisons are stated in terms of whether the rate of tree mortality, stand vigor and growth, and species composition are: a) well outside, b) outside, or c) within the range of natural conditions. Trend is shown in terms of whether forest condition is estimated to be improving, static, or deteriorating.

Genetic Diversity

Genetic diversity refers to the sum of different genotypes (individuals) within an ecosystem. The level of genetic diversity may be characterized in terms of variation in genetic composition which occurs within stands, between stands, and within a local region. An organism's genetic composition is determined when the male and female gametes unite. At that time, a nearly unlimited number of genetic combinations are set for the life of the organism, resulting in a specific genotype for each individual. Mating systems that depend on wind-dispersed male gametes, such as conifer trees, have naturally much higher levels of genetic diversity than a species where one male provides the bulk of the male gametes, as within an elk herd. In a defined ecosystem, genetic diversity is resistant to change. Unless an organism can move from an ecosystem, the level of genetic diversity at any given time is determined by the life span of the individual species of concern. The number of genes within a species can range from 1,000 in bacteria, to 10,000 in fungi, to 400,000 or more in flowering plants (Wilson 1988). In general, each individual is genetically different than any others of its species.

Principal changes to genetic diversity of BLM-managed ecosystems over the last 100 years are associated with activities that have reduced the available breeding population of a species. Activities which remove individuals (such as logging or hunting) lower the potential mating opportunities. Habitat fragmentation as a result of forest management activities, or natural occurrences such as fire, may also create barriers for mating opportunities. Genetic diversity can be affected if the barrier is very large, or maintained for a long period of time. The introduction of exotic species and diseases can have the same effect. Most silvicultural actions affect short-term genetic composition to some degree (Ledig and Smith 1981).

Approximately 6,800 acres of BLM-administered land have been planted with genetically-selected trees. Tree-breeding programs are designed to prevent excessive narrowing of gene pools. Although it is impossible to say that "no impact" to genetic diversity has resulted from this effort, it is reasonable to say that "no effects" are anticipated. Seed used for the planting of these seedlings was produced from trees selected from the same areas planted. Extensive testing was conducted to verify that seedlings produced from genetically selected parents possessed adaptive traits for the sites in which they will be planted. The seed used were the result of open mating systems, thereby ensuring the potential for equal levels of genetic diversity.

All living organisms are subject to continual environmental changes. Most changes occur at a very slow pace, which results in adaption. Any organism's success in adapting to changing environments is determined by its ability to survive and reproduce successfully in the new conditions. Selection of seed source based on breeding units, seed zones, and elevation, and the storage of that seed is our best opportunity to maintain local genetic diversity and assure site adaptability of seedlings. See Appendix L for further discussion.

Species Diversity

Species diversity refers to the sum of species within an ecosystem, i.e., the variety of living organisms found in a distinct habitat. Organisms may include plants, birds, mammals, reptiles, insects, and less visible organisms such as soil mycorrhizal fungi. More than 1,000 invertebrate species, each with a distinct set of genetic characteristics, have been identified within a single old-growth stand (Franklin 1988). The soil under a square yard of forest may hold as many as 250 species of arthropods and 200,000 mites from a single taxonomic group, plus tens of thousands of other mites, beetles, centipedes, pseudoscorpions, springtails, and spiders (SEIS 1994). Maintaining species diversity requires maintaining viable populations of each species. When local populations of a species drop below this level, local extinction of the species becomes more probable (Schafer 1990). This is a

Table 3-16. Estimated Condition of Forests of the Coos Bay District Relative to the Range of Historical Variation

Plant Series [1]	Forest Characteristic Rate of Tree Mortality	Stand Growth and Vigor	Species Composition	Trend
Tanoak	Within	Outside	Outside	Deteriorating
Western Hemlock	Within	Within	Within	Static
Douglas-fir	Within	Within	Within	Static

[1] Series is used in this comparison, rather than Major Plant Grouping, because the information was gleaned from inventory data, research data and other publications which could be best referenced to Series classifications. See the vegetation section for a comparison between Series and Major Plant Groupings.

natural process which continues in spite of human actions.

Species diversity varies from place to place and has changed over time. Plant species diversity within and between natural stands depends on differences in site and potential natural vegetation and differences in the intensity, extent, and time since natural disturbance events. Species diversity of managed stands varies depending on time since harvest, potential natural vegetation, and the management regime applied. Table 3-17 displays tree species composition in late successional-forest stands within the district.

Plant species diversity is partly dependent on the variety of plant associations. The acres of the various major forest plant groupings occurring on BLM-administered lands in the district are shown in Table 3-22. Their distribution is shown on Map 3-3. Plant species diversity within natural Douglas-fir stands and those under even-aged management varies by stand age. The species composition of unmanaged, natural forests was shaped by the interaction of evolutionary processes, changes in climatic conditions which occurred over time, and ecological processes such as disturbance and succession (Polunin 1960). In southwestern Oregon, the type and frequency of disturbance plays a major role in determining the natural distribution of plants, largely because of natural fire frequencies. Long-term reduction or elimination of disturbance would change the species composition of forest stands.

The coniferous species composition of managed forests also differs to some extent from unmanaged forests of the same ages. Unmanaged, natural forests were shaped by ecological processes of wild fire, windthrow, insect attack, and tree disease. Without frequent disturbance in the Siskiyou Mountains, conifers would be replaced by the more tolerant tanoak hardwood species. Fire cycles in the Coast Range tended to favor the more fire-tolerant Douglas-fir rather than the shade-tolerant climax species such as hemlock and cedar. The current species composition of stands depicted in Table 3-17 reflect, in part, the effects of protecting stands from wildfire.

For forests of southwestern Oregon and northern California, wildlife species richness appears to be independent of seral-stage. However, species abundance is highly correlated with the age and condition of stands (Raphael 1991). The old-growth stage has more shade-tolerant plant species such as Pacific yew, white fir, and western hemlock and tends to be the richest in insect species, lichens, fungi, and micro-flora and fauna. This variety of life is made possible by fine-grained patterns of disturbance in the old-growth seral stage and by large trees which support and shelter these organisms with favorable temperature and moisture

Table 3-17. Species Composition in Mature and Old-Growth Stands

Species Composition by Basal Area (Percent)				
Douglas-fir	Western Hemlock	Western Redcedar	Other Conifers	Hardwoods
85	8	3	3	1

regimes. Old-growth stands contain the most nonliving organic material and associated organisms.

Species diversity varies by physiographic province. The Siskiyou Mountain Range is thought to have a higher level of plant species diversity than any other temperate forest area (Arno and Hammerly 1984). The complex ecological sites of the Siskiyou Range may have served as refugia for plant species during periods of unfavorable climates. Many species exist there as relict populations (Whittaker 1961).

Native American cultures affected the distribution of plant and animal species through hunting and the use of fire, and white settlers affected animal species diversity through trapping and hunting. Logging and grazing affected plant species diversity on those areas accessible by pioneers, which generally included those lands adjacent to the alluvial plains and interior valleys.

Introduction of exotic plants, diseases, and insects also has affected species composition in the planning area. Port-Orford-cedar root rot, for example, could threaten the continued survival of this species. (See Forest/Ecological Health for further discussion on root rot.) Introduction of European beachgrass has also affected the species composition of the sand dune communities.

Landscape Diversity

Landscape diversity refers to the size, shape, and connectedness of different ecosystems and habitats on a local or regional basis. Landscape diversity may be described in terms of the arrangement of patches within a stand, or the arrangement of stands (ecosystems) within a watershed or larger area. For example, a landscape interspersed with grasslands, shrublands, meadows, ponds, streams, wetlands, and forests has greater biological diversity than one with a broad expanse of grassland.

Much of the concern about landscape management focuses on the amount and location of remaining late-successional forest patches. While several preliminary ecological definitions of old growth have been developed by researchers (Old Growth Definition Task Group 1986, PNW-GTR-447), BLM has no specific mature and old-growth inventory showing what stands meet a specific definition. For this document, stands are defined by age classes and the extent that ecological functions and processes inherent to the seral stage are retained (see Table 3-21).

For interim purposes and for modeling silvicultural regimes that retain older forest characteristics, BLM used data from continuous forest inventory plots which characterize old growth and mature forest types.

Timber harvest has reduced the proportion of the forest that exists as mature and old-growth stages and has fragmented such stands into a series of habitat islands separated by younger or partial cut forests. The remaining natural forest on BLM-administered land is further fragmented because of the "checkerboard-ownership" pattern. Clearcuts tend to be spread across the landscape and range in size from 10 to 60 acres. Partial-cut units vary from small areas to partial sections.

The size of old-growth patches and the seral stage of adjacent stands affect the quality of habitat within old-growth stands. All smaller patches and those portions of old-growth stands close to the edge of an early-seral block are subject to a variety of external factors that may reduce their effectiveness as old-growth habitat. External factors include wind, temperature, and predation from species inhabiting adjacent lands. Thus, interior old-growth habitat is substantially less than total old-growth acres (Harris 1984).

Edge effects extend approximately 600 feet into old-growth stands from adjacent clear cuts or young stands due to changes in environmental parameters such as light, temperature, and relative humidity. Old-growth stands must exceed 1,200 feet across and 26 acres in size before interior old-growth habitat is fully expressed (Harris 1984). However, some research indicates the effect of edge on relative humidity extends more than 700 feet into old-growth stands (Chen, Franklin, and Spies 1990). Other analysts have concluded interior habitat starts about 400 feet from adjacent clearcuts; both the Wilderness Society and the USFS have used that distance in recent analyses.

Interior, late-successional forest habitat on BLM-administered land is shown in Table 3-18. Interior habitat is at least 400 feet from adjacent private land or forest stands younger than 70 years. Many of the remaining blocks of old growth contain little interior habitat because of their size.

These remaining older forest blocks are distributed throughout the planning area (see Map 3-3). The impact of the current level of habitat fragmentation on species number and survival is uncertain. Theory predicts old-growth-dependent species will be lost from isolated habitat islands due to genetic isolation, inbreeding, and random mortality (Harris 1984). Correlations between fragmentation and the richness and abundance of animal species in Pacific Northwest forests are weak, although the potential for effect has been shown for tropical forest (Klein 1989; Lehmkuhl and Ruggiero 1990).

Refer to Chapter 4, Biological Diversity, for additional information on current stand condition and future potential.

Ecosystem Diversity

Ecosystem diversity refers to the combinations and arrangements of species and ecological processes which occur in different physical settings, expressed as plant community types. It includes the variety and relative abundance of structural and other living and dead biotic elements within ecosystems as well as species composition. This aspect of biological diversity includes riparian communities, young stands, mature and old- growth forests, upland meadows, and serpentine areas within the planning area. Special and unique ecosystems provide another component of ecosystem diversity. These include wetlands and salt marshes, the Siskiyou serpentine areas, sand dune areas, tanoak-madrone hardwoods stands, and plant communities of rockland and talus slopes (see Vegetation, Special Areas, and Water sections).

Table 3-18. Existing Older Forest Blocks

Block Size (acres	Old-Growth (Age 200+)		Old-Growth and Mature Combined		Interior Old-Growth Habitat	
	No. of Blocks	Total Acres	No. of Blocks	Total Acres	No. of Blocks	Total Acres
20-79	176	7,000	437	17,600	84	3,300
80-299	87	13,200	159	24,100	30	4,500
300-599	18	6,900	48	19,900	6	2,400
600+	14	23,200	32	55,700	3	2,200

Data based on 1988 inventory.

Ecosystem diversity may be described at a variety of scales, from canopy gaps and other structural and seral elements within individual stands to entire stands and watersheds.

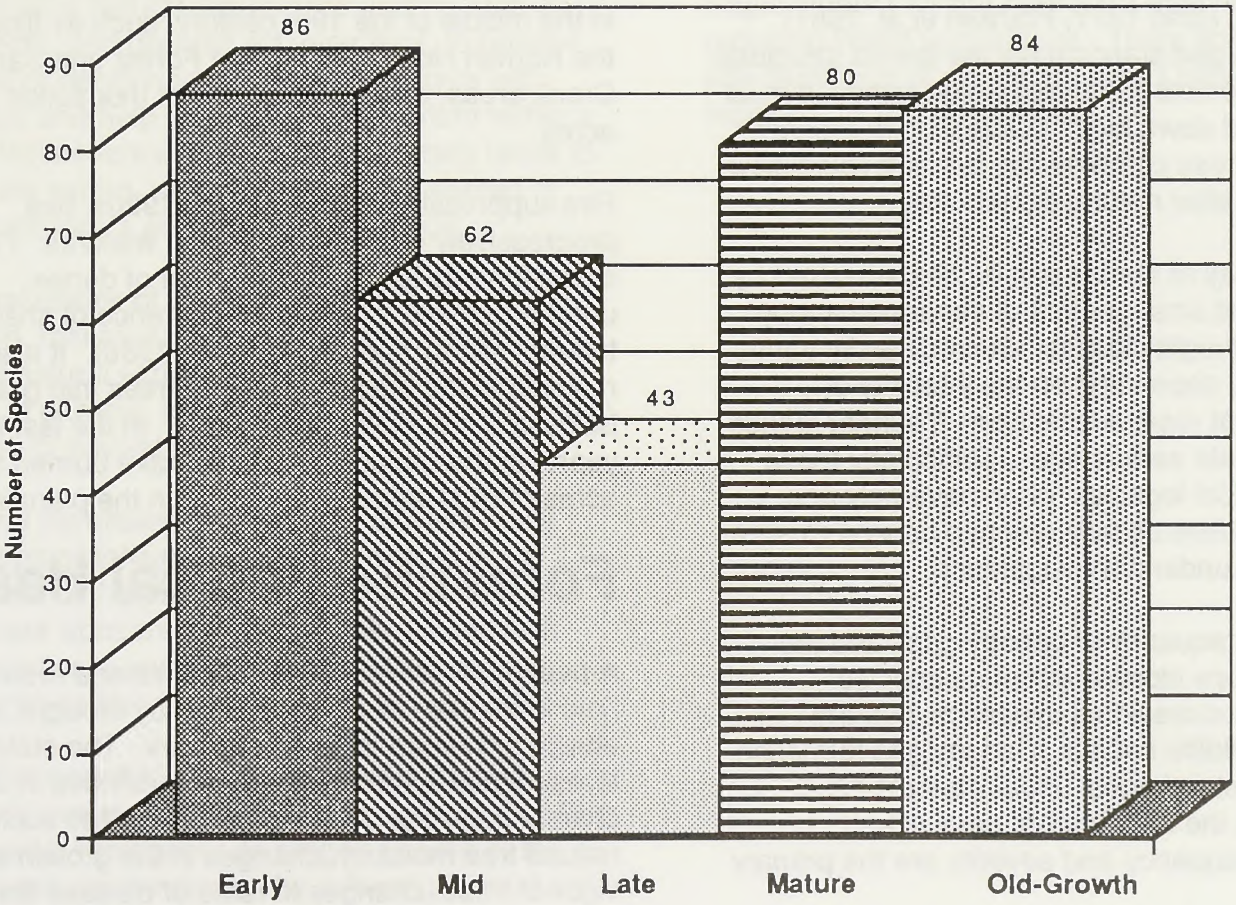
Potential ecosystem development is defined by describing potential natural vegetation in terms of series and plant associations. Classification of communities into plant associations is incomplete on BLM-administered land. For purposes of this document, ecological potential was broadly characterized into interim classifications called "major plant groupings" (see Vegetation section and Table 3-21). Series and association descriptions which broadly fit southwestern Oregon were published by Tesch et al. (1993).

Plant and animal species in natural ecosystems vary by seral stage (see Vegetation and Wildlife sections). Early seral communities usually have the largest number of higher (vertebrate) animal species and high representations of sun-tolerant, pioneer plant species such as grass. As succession progresses, the number of species declines and the species present change. In forest communities, species diversity increases again as the old-growth stage is approached, but the species mixture differs from the early and mid-seral stages. The old-growth stage supports shade-tolerant plant species and tends to be the richest in insect species, lichens, fungi, and micro-flora and fauna. The large trees support and shelter these organisms with favorable temperature and moisture regimes. There are greater amounts of nonliving organic material.

Figure 3-1 displays the relationship between the number of animal species using different seral stages as primary habitat on the Coos Bay District.

The old-growth seral stage has a greater structural diversity than even-aged, younger, closed-canopy seral stages. To interpret the existing forest inventory, BLM has defined old growth as forest land which is at least 10 percent stocked with trees 200 years or older in stands which are 10 acres or larger in size. While a correlation exists between habitat and age, the condition of older forests is variable. Douglas-fir forests may develop old-growth characteristics between 150 and 250 years of age (Spies and Franklin 1988).

Figure 3-1. Relationship Between Animal Species Primary Habitat and Seral Stages



The most obvious differences between seral stages are differences in stand structure such as the numbers of large trees, snags, and fallen trees. Structures retained from later seral stages to the early seral stage (biological legacies) help provide for the reestablishment of mature and old-growth species and ecological functions after disturbance. In unmanaged forests, the level of retention varies greatly between stands. Physical structures provide habitat niches, energy sources, and physical substrates that support processes such as nutrient cycling, plant and animal reproduction, and nitrogen fixation. The assemblage of species and structures varies between seral stages and supports the processes of forest succession, incorporation of organic matter into soils, and predator-prey relationships.

The death and fall of large trees influence the structure and dynamics of forest ecosystems (Franklin, Shugart, and Harmon 1987). Snags provide habitat for cavity users (see Wildlife). Dead and down woody material provides habitat for many species including decomposers, which are an integral part of healthy forest ecosystems. Over time, as snags fall and down logs decay, within-stand structure decreases unless large green trees are left on the site to replace dead components. See Table 3-19 for dead and down material in conifer stands.

Structural diversity is lower during the mid- and late-seral stages of natural stands than during other stages of successional development (Franklin and Dyrness 1973, Long 1977, Franklin et al. 1981). Younger managed stands have the lowest structural diversity due to timber harvest which removed most dead trees and down logs. Harvesting in recent decades left these components, but at levels below that occurring after natural disturbance.

Vertical diversity of stands can be characterized by the number and arrangement of separate canopy layers or tree height classes. Such diversity varies by seral stage, depending on the intensity of disturbance that reset succession. Younger stands in the mid- to late seral-stages, particularly those without biological legacies, often have only one canopy layer, have usually reached canopy closure, and have little understory vegetation.

The size and frequency of canopy gaps and the degree of canopy closure influence species composition, successional dynamics, nutrient cycling, and wildlife habitat. Canopy gap formation occurs as the stand ages, usually becoming pronounced in the later mature seral stage. Disturbance frequency and severity are the primary determinants of gap formation (Spies, Franklin and Klopsch 1990).

Functional diversity refers to the variety of ways in which different ecosystems or ecosystem segments operate and change over time and the manner in which energy and nutrients are created, stored, or flow within the systems. Functions are maintained within the range of natural variation as long as the species, structures, and structural arrangements of ecosystem components are also within the range of natural variation at scales, and with spatial and temporal extents, at which the process operates.

Of all the functional mechanisms responsible for shaping forest communities, disturbance events are particularly significant. These events reset plant succession in entire stands or in patches and prevent succession from continuing to a true climax on most sites. They include wildfire, windthrow, insect attack, and tree disease. Fires have been the predominant events and have played a major role in plant succession. The prehistoric cycle of stand-replacing fires (which cause high or complete mortality in an understory stand of trees) probably averaged 200 years. In the cool moist areas of the Coast Range where rapid dense growth contributed to heavy build-up of fuels, fire cycles were longer and generally resulted in large acreages being devastated. In the warmer, drier areas of the Siskiyou Mountains, fuel build-up was slower, fire cycles were more frequent, and fires were less intense and smaller in size than those occurring further north. Stand-replacing fires in the middle of the 19th century, such as those in the Roman Nose, Elliott State Forest and Sandy Creek areas, each burned tens of thousands of acres.

Fire suppression, starting in the 1920s, has progressively reduced the size of wildfires. Fire exclusion has led to development of dense underbrush and increased occurrence of shade-tolerant climax species (Stewart 1986). It also resulted in the encroachment of trees into grassy balds and meadows (Vale 1981). In the last ten years, stand-replacing wildfires have burned 5,248 acres of BLM-administered land in the planning area.

Forest/Ecological Health

A healthy forest remains productive and resilient over time in the face of stress caused by drought, insect attack, or human-induced changes. The state of forest health is most commonly quantified in stand characteristics and ecological processes such as natural tree mortality, changes in the growth and vigor of trees, changes in rates of disease spread,

Table 3-19. Dead and Down Material (conifer stands)

Seral Stage (or Age Class)	Down Logs [1]
Early-Mid	23 tons/acre
Late	28 tons/acre
Mature	13 tons/acre
Old-Growth	39 tons/acre

[1] Average computed from data collected on 305 5-point inventory plots.

and changes in species composition. Healthy forests are dynamically stable with characteristics and processes fluctuating within a range of natural variability. When management processes result in ecosystems being pushed outside of the range of natural variability there is an increased risk that ecological functions will not be maintained at either the stand level or the landscape level. This risk does not mean that all elements or processes must be maintained within their natural range, only that care must be taken to control undesirable and unintended side-effects of management actions. Using limited data and professional judgement, the ecosystems in the planning area are, overall, estimated to be well within their natural variation.

The effects of natural disturbance agents such as fire, insects, and disease act, over time, to reverse the trend of decaying stability which occurs with stand age and help to establish equilibrium within a stand. Maintenance of landscape diversity tends to reduce the extent, severity, and rate of spread of large scale insect and disease epidemics.

Field evaluations of young stands indicate, for the most part, that mortality rates are well within their range of natural variability. Older forest stands also appear, in general, to be healthy with mortality within the range of natural variability.

Of natural disturbance agents, the disease black stain *(Leptographium wageneri)* is of concern in some parts of the planning area. The incidence of the disease appears to be highly associated with compacted soils and along roads. Black stain's contribution to forest decline is largely unknown.

The introduced disease, Port-Orford-cedar root rot (*Phytophthora lateralis*), is a significant threat to Port-Orford-cedar throughout its range. Spores of the root disease can be spread by adhering to mud on the feet of animals or humans, or to mud on the wheels of equipment used in road construction or logging, with the latter being the most frequently attributed cause. Once established in a stand, the disease kills mostly larger trees and replacement trees before they reach merchantable size. Since research has not identified any resistance to the disease or effective treatment, the only method of control is restrictions placed on stand management practices.

Historical evidence indicates that drought stress and other major catastrophes can lead to insect outbreaks in the Pacific Northwest. Within the planning area, however, no major insect outbreaks have occurred, even after natural catastrophes. Rapid timber salvage may have been instrumental in reducing insect populations. There appears to be little likelihood of significant insect population increases in the near future.

Vegetation

Introduction

Appendix A to the *Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl*, the *Report of the Forest Ecosystem Management Assessment Team* (FEMAT)(1993) identified 914 plant species closely associated with older forests within the range of the northern spotted owl. This total included 527 fungi species, 106 bryophyte species, 157 lichen species, and 124 vascular plant species. The total number of species occurring within the range of the northern spotted owl is much greater. The total number of species occurring within the Coos Bay District is not known.

Hornworts, liverworts, and mosses (collectively known as bryophytes) are small, green, spore-bearing plants that include a wide array of species well adapted to nearly every habitat on earth. About 170 species of liverworts and 450 species of mosses occur within the range of the northern spotted owl. About 20 percent of these species are endemic to western North America or the Pacific Northwest (Lawton 1971).

Fungi are neither plants nor animals but are recognized as a separate kingdom of organisms both in structure and function. The large number of macrofungi in late-successional and old-growth forests, especially those of uneven-aged structure, reflects the complexity of these ecosystems as well as or better than many other groups of organisms. Estimates indicate there are at least six species of fungi for every vascular plant species in a given temperate ecosystem (Hawksworth 1991). Of the 527 species of fungi that were evaluated as closely associated with late-successional and old-growth forests, 109 (21 percent) are known to be endemic to the Pacific Northwest (FEMAT Report 1993).

The lichen flora in the Pacific Northwest is diverse and abundant. Lichens are a conspicuous component of old-growth forest ecosystems where they play an important ecological role. The lichen flora of the Pacific Northwest includes many endemic species, so extirpation of these species in the region equates to the extinction of the species as a whole. Twenty-six species closely associated with old-growth forests are endemic to the Pacific Northwest.

The largest and most dominant organisms of the late-successional and old-growth forest ecosystem are the vascular plants. Vascular plants are those that contain conducting or vascular tissue. They include seed-bearing plants (flowering plants and conifers) and spore-bearing forms such as ferns. They create the structure of the forest and function as the primary producers, capturing sunlight through photosynthesis and converting it to food consumed by other animals and fungi. Vascular plants provide substrate and habitat for other organisms, influence microclimates (e.g., sunlight, humidity, and temperature), and provide forage, hiding, and thermal cover for vertebrate and invertebrate species. They produce litterfall that contributes to organic matter and soil development. Some species are symbiotic with fungi and other vascular plants, while others fix nitrogen. Many vascular plants have close relationships with specific animal pollinators and predators.

In addition to their vital role in maintaining a functioning ecosystem, vascular plants provide commercial resources, including timber, forage, and other forest products. Harvest of medicinal, horticultural, and edible plants has increased dramatically in recent years.

See the FEMAT Report for a more detailed discussion.

Vegetation or natural plant communities on the district exist within an ecosystem influenced by and influencing the earth and soils, water and air. The vegetation that occurs is the result of a broad range of interacting factors, including soils, moisture, temperature, nutrient availability, elevation and aspect. Variations in vegetative type are also partially attributable to disturbances in nature such as fire and windstorms, and human-caused disturbances such as logging and prehistoric burning.

Vegetation is categorized by plant communities classified according to the dominant plant species. These plant communities contain animals which depend on them for food and cover. In many cases, animals are critical in pollination and seed dispersal, and may be the key factor that permits plant species to migrate in response to climatic changes.

For the purpose of this RMP/EIS, vegetation is generally described in terms of “zones” adapted from those identified by Franklin and Dyrness in *Natural Vegetation of Oregon and Washington* (1973). The district's major forest vegetative zones are the Sitka Spruce Zone and the Western Hemlock Zone.

These zone names denote only the single dominant species of the potential climax vegetation.

The Sitka Spruce Zone is usually found within a few miles of the coast, and may extend inland in some valleys and drainage areas. This zone may approximate what has been termed the "fog belt." Only a small percentage of district-administered lands are in this zone. The Western Hemlock Zone extends inland from the eastern edge of the Sitka Spruce Zone to the eastern district boundary.

Plant Community Groupings

For the purposes of this document, upland plant associations within these zones have been classified into five major plant community groupings. These groupings, together with pertinent seral stages, provide the basis for describing the forestland communities and wildlife habitat. Information specific to plant community groupings, together with other data, is used to determine the conifer growth response expected from vegetation management.

Plant community groupings are classified and named according to existing dominant plant species rather than potential climax species. Other seral stages (rather than climax) are used to describe plant community groupings for the planning area because:

- The frequency of natural or human-caused disturbance events usually prevents attainment of a true climax.
- Old-growth plant communities are often not climax since neither plant composition nor stand structure stop changing after 200 years.

A plant community grouping is an aggregation of plant associations with similar management potentials, the same principal early seral species, and the same dominant late seral conifer species. The grouping names are based on species expected to be present after natural disturbance sufficiently intense to set the seral stage back to its first stage of secondary succession.

A plant series is an aggregation of plant associations with the same climax dominants. For instance, the Western Hemlock Series consists of associations in which western hemlock is the climax dominant. The series level of classification is broad and is most useful at the planning level or in stratification of inventories or research sites when it is desirable to stratify based on similarity of seral development patterns.

Major plant groupings were used because plant association and series classifications are incomplete on BLM-administered land and because emphasis had been placed on management of early successional vegetation in the description and analysis of even-aged, shorter rotation silvicultural systems. However, it is more useful and correct to use series classifications when discussing characteristics of unmanaged forests, making comparisons between the characteristics of managed forests and the characteristics of unmanaged later seral forests, and referencing research literature. This document uses both series and major plant groupings, depending on their usefulness and validity.

Table 3-20 shows the relationship between major plant groupings and series on the Coos Bay District.

A discussion of the structural characteristics of natural stands in northern California and southwestern Oregon can be found in *General Technical Report-285*.

Major Plant Groupings

The five major upland plant groupings on the district are: Douglas-fir/Red Alder/Salmonberry, Douglas-fir/Red Alder/Vine Maple, Douglas-fir/Tanoak-Madrone, Douglas-fir/Mixed Brush/Salal and Mixed Conifer/Interior Valley/Grass. Each is described below.

Douglas-fir/Red Alder/Salmonberry: (D/Ra/Sm) This grouping covers most of Coos Bay District north of the Douglas-fir/Tanoak-Madrone grouping, on Coast Range sites west of the Douglas-fir/Red Alder/Vine Maple grouping. This is a moist site grouping with Douglas-fir and western hemlock being the main overstory species and red alder being the primary hardwood. Port-Orford-cedar may be found in this association, principally along coastal streams between Coos Bay and Port Orford. Red alder may dominate sites for long periods. Shrubs consist of salmonberry, red huckleberry, salal, and vine maple. Swordfern is the primary understory species. Early succession generally results in fast shrub response and intense competition for light from both alder and salmonberry. Conifer reproduction may be subject to severe animal damage. Approximately 118,300 acres are in this grouping.

Table 3-20. Relationship Between Major Plant Groupings and Series on the Coos Bay District

Major Plant Grouping	Series
Douglas-fir/Red Alder/Salmonberry	Sitka Spruce Western Hemlock Douglas-fir[1] Port-Orford-cedar
Douglas-fir/Red Alder/Vine Maple	Western Hemlock Douglas-fir[1] Port-Orford-cedar
Douglas-fir/Tanoak-Madrone	Sitka Spruce Tanoak[1] Douglas-fir Port-Orford-cedar
Douglas-fir/Mixed Brush/Salal	Western Hemlock Douglas-fir[1]
Mixed Conifer/Interior Valley/Grass	Western Hemlock Douglas-fir[1] White Fir

[1] Principal Series in Grouping

Douglas-fir/Red Alder/Vine Maple: (D/Ra/Vm) This grouping occurs in the Burnt Mountain and Signal Tree Ridge part of the district. Following disturbance, competition from shrubs and hardwoods is moderate. The shrub species present are vine maple, evergreen huckleberry, blackberry, and salal. Red alder and bigleaf maple are usually present in varying densities. Red alder naturally seeds following site preparation, and bigleaf maple will sprout vigorously. When present, the herb layer consists of swordfern and oxalis. Plant communities vary depending on the impact and presence of marine air flows across the Coast Range. Drier sites will have more oceanspray and herbaceous competitors than wetter sites. Approximately 141,000 acres are in this grouping.

Douglas-fir/Tanoak-Madrone: (D/M-To) This grouping occurs in the southern portion of the planning area beginning roughly south of Highway 42 and continuing south to the California border. Conifer species present are Douglas-fir, true fir, incense-cedar and western redcedar. Port-Orford-cedar and other minor species occur along coastal stream bottoms or on wetter sites. This grouping is characterized by evergreen hardwoods and brush which sprouts immediately upon disturbance and persists in the stand even in the climax association. Tanoak competition is present in both tree and brush form varieties. Myrtlewood, bigleaf maple, rhododendron, huckleberry, ceanothus, manzanita and salal are common early-seral-associated plant species in the understory of mature and old-growth stands of the grouping. Approximately 52,000 acres are in this grouping.

Douglas-fir/Mixed Brush/Salal: (D/B/Sa) This grouping occurs in the Umpqua River corridor above the interior valley grouping and below 2,500 feet in elevation. Forests are mainly Douglas-fir with inclusions of western hemlock, bigleaf maple, western redcedar, and incense-cedar. Shrubs include salal, vine maple, Oregon grape, and hazel. Herbs consist of swordfern and bracken fern. Regeneration is not difficult and tree growth is good. The primary competition for conifers in early- and mid-seral stages is from sprouting hardwoods and brush species. Approximately 12,300 acres are in this grouping.

Mixed Conifer/Interior Valley/Grass: (MC/IV/Gr) These are communities of the dry interior ridges of the Siskiyou Mountains and lower slopes of the Coast Range on the east side of the district. Grass, herbaceous vegetation, poison oak, and deerbrush ceanothus present severe competition for conifers in this grouping during the early-seral stage. Conifer species are predominately Douglas-fir and hemlock. Tree-form hardwoods are also present in this grouping. Hardwoods, however, form a lower percentage of the total basal area than in madrone-tanoak groupings in the Siskiyous. Deciduous brush offers some growth competition in the early life of conifer stands, particularly on hot aspects. Manzanita is locally present and may form dense stands which occupy conifer sites for long periods of time. Approximately 6,500 acres are in this grouping.

Seral Stages

Five seral stages (early seral, mid seral, late seral, mature seral and old-growth) have been described for each major upland plant grouping. The speed of seral changes varies somewhat within the district from better to poorer sites and between major plant groupings. For analytic purposes, changes are similar enough for all upland vegetation to have a common duration.

Early-Seral Stage - The period from disturbance to crown closure of conifer stands managed under the current forest management regime. Grass, herbs, or brush are plentiful up to age 15. Forage is present, but hiding or thermal cover for big game may not be present.

Mid-Seral Stage - The period in the life of a forest stand from crown closure to first merchantability. Usually ages 15 through 40. Due to stand density, the brush, grass or herbs rapidly decrease in the stand. Hiding cover for big game is usually present.

Late-Seral Stage - The period in the life of a forest stand from first merchantability to culmination of mean annual increment. Usually ages 40 to 100 years of age. Forest stands are dominated by conifers or hardwoods; canopy closure often approaches 100 percent. During this period, stand diversity is minimal, except that conifer mortality rates and snag formation will be fairly rapid. Big game hiding and thermal cover is present. Forage is minimal except in understocked stands.

Mature-Seral Stage - The period in the life of a forest stand from culmination of mean annual increment to an old-growth stage or to 200 years. Conifer and hardwood growth gradually decline, and larger trees increase significantly in size. This is a time of gradually increasing stand diversity. Understory development increases in response to openings in the canopy from disease, insects, and windthrow. Vertical diversity increases. Larger snags are formed. Big game hiding and thermal cover and some forage are present.

Old-Growth Stage - The potential plant community capable of existing on a site given the frequency of natural disturbance events. For forest communities, this stage exists from approximately age 200 until the time when stand replacement occurs and secondary succession begins again. Depending on fire frequency and intensity, old-growth forests may have different structures, species composition, and age distributions. In forests with longer periods between natural disturbance, the forest structure will be more even-aged at the late mature or the early old-growth stages.

As mortality occurs, stands develop greater structural complexity. Replacement of trees lost to fire, windthrow, or insects results in the creation of a multilayered canopy. There may be a shift toward more shade tolerant species. Big game hiding cover, thermal cover, and forage is present.

Within the district, and in particular in the Douglas-fir/Red Alder/Salmonberry and Douglas-fir/Red Alder/Vine Maple plant groupings, old-growth stands contain a higher percentage of western hemlock and fewer Douglas-fir as stand age increases. Without a disturbance event to reset succession, these stands over time would convert primarily to hemlock stands.

Dominant seral vegetation for each of the five seral stage groupings are shown in Table 3-21, and acres of major plant groupings and seral stages are listed in Table 3-22. Figure 3-2 shows typical seral stages. Map 3-3 displays the major plant groupings and location of the mature and old-growth seral stages.

Fire and other human activity have played a major role in plant succession as described in the Biological Diversity section.

Table 3-21. Dominant Seral Vegetation by Major Plant Grouping

Plant Group (Age Class)	Early Seral (0-10 Yrs.)	Mid Seral (20-30 Yrs.)	Late Seral (40-80 Yrs.)	Mature (90-190 Yrs.)	Old-Growth (200+ Yrs.)
D/Ra/Sm	He-Sh-Hd	C-Hd	C-Hd	C	C
D/Ra/Vm	He-Sh-Hd	C-Hd	C-Hd	C	C
D/M-To	Sh-Hd	C-Hd	C-Hd	C-Hd	C-Hd
D/B/Sa	He-Sh-Hd	C-Hd	C-Hd	C-Hd	C-Hd
MC/IV/Gr	He-Sh-Hd	C-Hd	C-Hd	C-Hd	C-Hd

Abbreviations used in this Table:

He = Herb
Sh = Shrub
Hd = Hardwood
C = Conifer
D/Ra/Sm = Douglas-fir/Red Alder/Salmonberry
D/Ra/Vm = Douglas-fir/Red Alder/Vine Maple
D/M-To = Douglas-fir/Tanoak - Madrone
D/B/Sa = Douglas-fir/Mixed brush/Salal
MC/IV/Gr = Mixed Conifer/Interior Valley/Grass

Note: Age class defines a 10-year period of time, with the mid-point accepted as the age class break. For example, stands in age class 20 have an actual age between 16 and 25 years.

Table 3-22. Acres of Major Plant Groupings and Seral Stages

Plant Group (Age Class)	Early Seral (0-10 Yrs.)	Mid Seral (20-30 Yrs.)	Late Seral (40-80 Yrs.)	Mature (90-190 Yrs.)	Old Growth (200 + Yrs.)	Total
D/Ra/Sm	31,589	33,027	15,749	24,062	13,875	118,302
D/Ra/Vm	32,368	34,131	20,290	23,114	31,011	140,914
D/M-To	17,528	3,590	11,012	18,580	1,327	52,037
D/B/Sa	3,903	3,096	438	1,425	3,431	12,293
MC/IV/Gr	894	46	613	3,283	1,656	6,492
Total	**86,282**	**73,890**	**48,102**	**70,464**	**51,300**	**330,038**

Abbreviations used in this table:

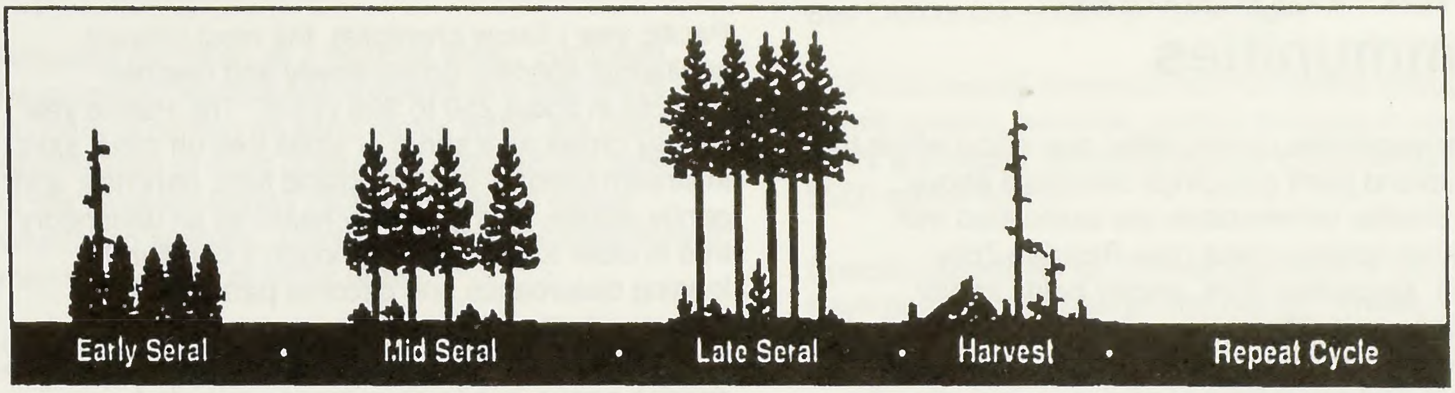
D/Ra/Sm = Douglas-fir/Red Alder/Salmonberry
D/Ra/Vm = Douglas-fir/Red Alder/Vine Maple
D/M-To = Douglas-fir/Tanoak-Madrone
D/B/Sa = Douglas-fir/Mixed Brush/Salal
MC/IV/Gr = Mixed Conifer/Interior Valley/Grass

Note: Age class defines a 10-year period of time, with the mid-point accepted as the age class break. For example, stands in age class 20 have an actual age between 16 and 25 years.

Note: Data as of 1988.

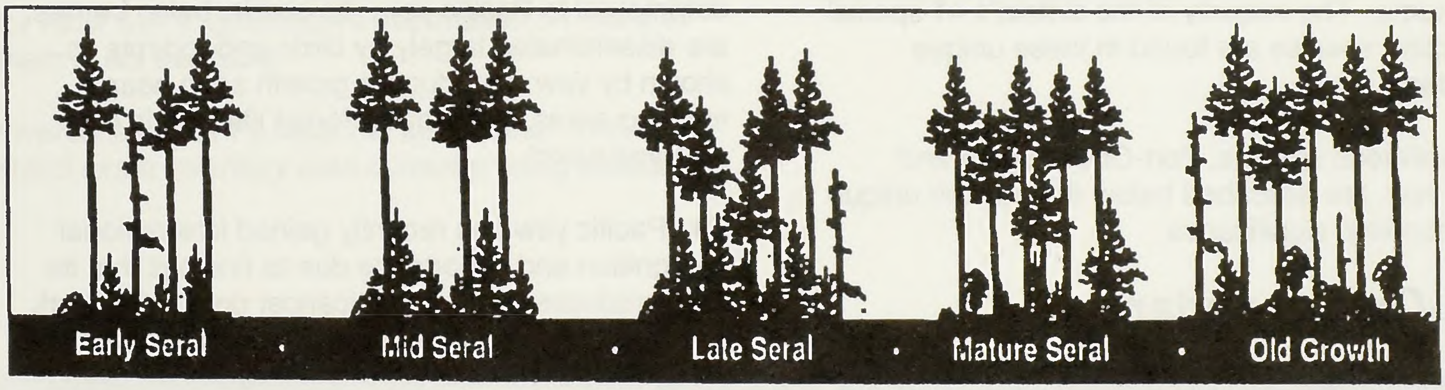
Figure 3-2. Typical Seral Stages

Even-Aged Managed Forest



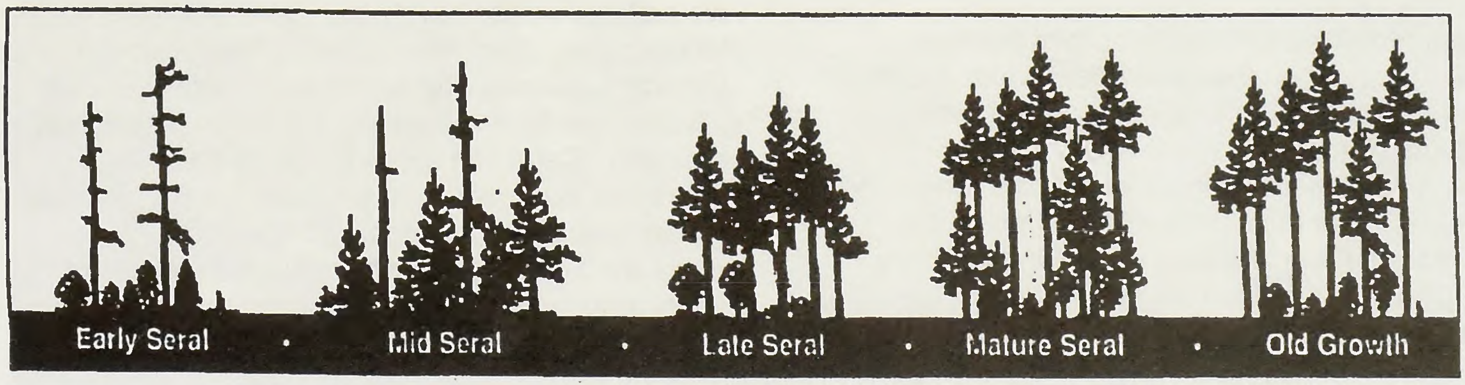
This successional path begins after nearly complete removal of overstory trees in logging. A small amount of down logs and snags remain. Stand development is even-aged. Harvest on short rotations precludes development of the mature or old-growth stages.

Natural, Partial Stand Replacement



The early seral stage consists of combinations of surviving green overstory trees, snags, and down trees. Openings consist of young conifers, forbs, brush, and hardwoods. Stand development is uneven-aged and patchy, with vegetation developing in the understory and openings. Overstory trees die, turn into snags and eventually fall.

Natural, Catastrophic Stand Replacement



The early seral stage consists of snags, down trees, conifer seedlings, forbs, brush, and a few living trees which serve as a seed source. Succession progresses in a basically even-age sequence, with diversity of vegetative layers developing in mature and old-growth stages.

Appendix S provides some detail on the relative occurrence of common species within each of the major plant groupings within the district.

Minor Vegetative Communities

Smaller vegetative communities may occur within the major upland plant groupings described above. These smaller communities are associated with wetland or riparian areas (see Riparian Zone section), serpentine soils, grassy balds and/or meadows, rock cliffs or talus slopes. The district also has minor plant communities associated with tidelands and oceanfront sand dunes, including the introduced European beachgrass which poses a problem. Individual plant species of these communities are adapted to the unique environmental or physical conditions of those locations, which may be considered unique ecosystems. The majority of the district's 41 special status plant species are found in these unique ecosystems.

Two coniferous species, Port-Orford-cedar and Pacific yew, are described below due to their unique socioeconomic significance.

Port-Orford-cedar

Port-Orford-cedar (*Chamaecyparis lawsoniana*) is a coniferous species common only in those areas west of the Coast and Siskiyou ranges in southwestern Oregon and northwestern California. Some are also found further inland near the Oregon-California border. In the planning area, the species is found throughout the Tioga and Myrtlewood resource areas.

The value of Port-Orford-cedar ranges between $750-$8,000 per thousand board feet which exceeds the prices for other conifer species. The species is very fire resistant, more shade tolerant than most conifers, and grows well under forest canopies or in open areas. Due to its unusual adaptability, the Port-Orford-cedar grows on a wide variety of sites including coastal sand dunes, swampy sites, dry rocky ridges, and serpentine soils. Wood quality and value of the cedar vary according to its growing site.

In spite of its adaptability, the Port-Orford-cedar is subject to infestation with the introduced fungus, *Phytophthora lateralis*, commonly referenced as "root rot". First discovered within the cedar's natural range in 1952, the disease now affects plants over much of its range, including most of those in the planning area.

Pacific Yew

Pacific yew (*Taxus brevifolia*), the most tolerant coniferous species, grows slowly and reaches maturity in about 250 to 300 years. The Pacific yew usually grows as a shrub or small tree on moist sites in stream bottoms and on upland flats, benches, and gentle slopes. It is generally found as an understory tree in older forest types, although it can survive logging disturbance and become part of younger even-aged stands. In the planning area, the species is found on upland sites and to a lesser extent in riparian zones, but its abundance varies between sites more so than other species.

When moderately disturbed, the Pacific yew can regenerate naturally by resprouting, while disturbances such as intense fire are frequently detrimental to Pacific yew. Its seeds, being berries, are disseminated largely by birds and rodents as shown by yew reproductive growth seen near roosting areas, in decaying forest litter, or in old decayed wood.

The Pacific yew has recently gained international recognition and importance due to findings that its bark produces taxol, an anticancer drug. Yew bark has been sold and collected from timber harvest areas prior to the harvest of other species. Inventories have been conducted to determine the amount of yew on the district. Management strategies are described in the Record of Decision for the *Pacific Yew* EIS (1993).

Noxious Weeds

Five noxious weeds have been identified in the planning area. Two weed species, tansy ragwort (*Senecio jacobaea*) and purple loosestrife (*Lythrum salicaria)*, are listed as priority 2 species (possible to eradicate). Canadian thistle (*Cirsium arvense*), gorse (*Ulex europaeus*), and Scotch broom (*Cytisus scoparius*) are listed as priority 3 species (established populations which may be capable of control or for which further spreading may be prevented).

Noxious weeds are not a major threat at this time. Of the noxious weeds in the planning area, Scotch broom is currently the most rapidly increasing in the area occupied . However, once desired forest species become established, Scotch broom is readily shaded out.

While not a major problem, minor colonies of gorse have been found on BLM-administered lands, most notably on the North Spit of Coos Bay. These colonies have been treated several times and may require future treatments to control their spreading.

Although not listed as a noxious weed, European beachgrass (*Ammophila arenaria*) is a species of concern occurring on sand dunes within the district. Stabilization of sand dunes has reduced the habitat of the Western Snowy Plover as well as native vegetation species. Control of European beachgrass may be required in some areas.

Special Forest Products

Special Forest Products (SFPs) are located throughout the district with numerous plant species actually used. A partial listing of existing or potential SFPs species and their possible uses is found in Table 3-23. Although qualitative information exists for most SFPs, quantitative information on many of them is not available.

Inventories of SFPs have not been done. The forest stand exam inventory data currently being collected on the district contains elements which document the occurrence of some SFPs. Documentation of these products also occurs when they are harvested under permit. Those that have been sold for harvesting under permit between FY87 and FY91 from the Coos Bay District are shown in Table 3-24.

SFPs are legally removed from the forest through a permit system, however, certain amounts of specific SFPs are legally removed without a permit (43 CFR 5500 and/or 8365).

Specific guidelines for the management of SFPs have been established on the district. These guidelines are reviewed and adjusted if needed.

Mushroom harvesting has received much publicity. Availability of mushrooms varies year to year and largely dependent on weather conditions. Increasing demand from foreign markets and changing economic conditions have increased the interest in harvesting wild mushrooms.

Table 3 -23. Partial Listing of Existing or Potential Special Forest Product Species on the Coos Bay District and Their Possible Uses

Existing/Potential Special Forest Products	CR	CO	FU	FO	GR	LP	PH	PO
Most important								
Douglas-fir (2)		X	X		X	X	X	X
Port-Orford-cedar (2)			X		X	X		X
Western redcedar (3)			X		X	X		X
Western hemlock (3)		X	X			X	X	
Incense-cedar (2)			X		X	X		X
Red alder (1)	X	X	X	X		X		
Tanoak (3)			X		X			
Madrone (2)			X		X			
Myrtlewood (2)	X		X	X				
Bigleaf maple (2)			X					
Evergreen-huckleberry (2)				X	X	X		
Common sword fern (3)					X	X		
Salal (2)	X			X	X		X	
Less important								
Sitka spruce (2)	X	X	X				X	X
Shore pine (1)		X	X		X			X
Golden chinquapin (2)			X		X	X		
Cascara (2)			X				X	X
Pacific dogwood (2)	X		X	X		X		
Oregon white oak (1)	X		X			X		
Coastal black twinberry (3)	X					X		
Willows (1)	X			X			X	
Vine maple (3)	X		X		X	X		
Manzanita (2)						X	X	
Kinnikinnik (2)				X		X		
Rhododendron (3)					X	X		
Ocean spray (1)	X				X			
Bayberry (2)							X	

Table 3 -23. Partial Listing of Existing or Potential Special Forest Product Species on the Coos Bay District and Their Possible Uses (continued)

Existing/Potential Special Forest Products	CR	CO	FU	FO	GR	LP	PH	PO
Blue elderberry (1)				X			X	
Red elderberry[1] (1)				X			X	
Himalaya blackberry (1)				X				
Evergreen blackberry (1)				X				
Trailing blackberry (1)				X				
Blackcaps (2)				X				
Thimbleberry (2)				X			X	
Salmonberry (3)				X				
Western red huckleberry (2)				X		X		
Redflowering currant (2)						X		
Large Oregon grape (2)	X			X	X	X	X	
Dwarf Oregon grape (3)	X			X	X	X	X	
Lady fern (2)					X	X		
Deer fern (3)					X	X		
Mountain-holly fern (2)						X		
Parsley-fern (2)				X		X		
Western bracken fern[1] (2)					X			
Leatherleaf fern (2)						X		
Giant chain fern (2)						X		
Ground or Vine maple moss (2)				X		X		
Foxglove[1] (1)							X	
Wood-sorrel (3)				X		X		
Goldenrod (1)				X		X	X	
Yarrow (1)				X	X	X	X	
Prince's pine (3)					X	X	X	
Skunk cabbage (2)							X	
Common cattail (1)		X			X	X		X
False-hellebore (1)							X	
Poison-oak[1] (2)							X	
Wild cucumber (2)							X	
American ginger (3)				X		X		X
St. John's wort (1)							X	

Table 3 -23. Partial Listing of Existing or Potential Special Forest Product Species on the Coos Bay District and Their Possible Uses (continued)

Existing/Potential Special Forest Products	CR	CO	FU	FO	GR	LP	PH	PO
Yellow monkeyflower (1)						X		
Devil's club (3)					X			
Beargrass (2)	X				X		X	
Mushrooms								
King Bolete (*Boletus edulis*)				X				
Chantrelle (*Cantharellus cibarius*)				X				
Matsutake (*Tricholoma magnivelare*)				X				
Cauliflower (*Sparassic crispa*)				X				
Lobster (*Hypomyces lactiflorum*)				X				
Hedgehog (*Dentinum repandum*)				X				
Oregon White Truffle (*Tuker ribossum*)				X				

Abbreviations used in this table:
CR = Crafts
CO = Cones
FU = Fuels
FO = Food
GR = Greenery
LP = Live Plants
PH = Pharmaceutical
PO = Potpourri

(1) Shade Intolerant; (2) Intermediate Shade Tolerance; (3) Shade Tolerant

[1] May be poisonous in some forms to humans.

Table 3 -24. List of Special Forest Products Sold Under Permit During FY 87-91

Product	Unit of Measure	District Issued Permits	Amounts
Sawtimber	MBF	453	3,096.28
Pulpwood	MBF	140	2,887.12
Marginal Logs	MBF	61	2,003.20
Bolts and Shakes	MBF	429	1,302.64
Arrow Stock	MBF	199	483.36
Corral Poles	MBF	1	1.76
Small Poles	MBF	3	18.90
Large Poles	MBF	0	0
Split Rails	MBF	1	.18
Line Posts	MBF	64	53.94
Corner Posts	MBF	12	0
Subtotal-Prod. Measured in MBF		1,363	9,847.38
Fuelwood	Cords	3,573	4,880.93
Subtotal-Prod. Measured in Cords		3,573	4,880.93
Cones	Bushels	4	250
Subtotal-Prod. Measured in Bushels		4	250
Christmas Trees	Number	32	3,006
Wildings [1]	Number	16	1,720
Subtotal-Prod. Measured Individually		48	4,726
Cascara Bark	Pounds	3	3,800
Moss	Pounds	14	11,700
Boughs	Pounds	736	319,952
Herbs	Pounds	0	0
Mushrooms	Pounds	2	205
Burls	Pounds	6	9,562
Subtotal-Prod. Measured in Pounds		761	345,219
Huckleberry Brush	Bundles	414	118,475
Ferns	Bundles	420	109,015
Beargrass	Bundles	0	0
Greens [2]	Bundles	94	16,517
Subtotal-Prod. Measured in Bundles		928	244,007
Total Number of Permits		6,677	

[1] Plants sold as transplants.

[2] Includes many SFP species used in crafts and floral designs.

Note: Since Pacific yew is currently being managed as a separate program, it is no longer considered a SFP.

Riparian Zones

Riparian zones occur throughout drainage systems and extend from the smallest headwater streams to the largest rivers. The size and extent of riparian zones depend largely on watershed characteristics such as topography, soils, rainfall, water quality and quantity, stream conditions, and width of floodplains. On BLM-administered lands in the planning area, riparian habitat is found along approximately 600 miles of third through ninth order streams and approximately 2,200 miles of first and second order streams. Third order and larger streams in the district's Analytical Watersheds were listed in Appendix III-C of the draft RMP. That appendix also showed the total stream and BLM stream miles according to stream order. These riparian acres comprise five percent of the land base or approximately 16,600 acres (see Table 3-25). Riparian vegetation along small, perennial third order streams comprises slightly over 41 percent of the total stream riparian acres. Riparian habitat also includes approximately 12 acres bordering ponds and lakes, and 523 acres of permanent wetlands.

Under natural conditions, conifers (western redcedar, hemlock, and Douglas-fir) dominate riparian overstories in small V-shaped drainages, while deciduous trees (red alder, bigleaf maple, and Oregon ash) gradually become more frequent in understories as streams increase in size. Understory deciduous trees, herbs and shrubs are generally more abundant in riparian areas than in upland communities. (See Figure 2-2.)

According to Campbell and Franklin (1979) and Franklin et al. (1981), the greatest structural diversity in riparian areas is, in general, provided by old-growth forest. This conclusion and the knowledge of BLM biologists were used as the basis to develop an evaluation method for determining the condition of riparian zones. The method uses average tree size, which can be derived from the operations inventory data base, as the indicator of riparian habitat condition. In western Oregon, riparian habitat with mature trees (i.e., average tree size greater than 21 inches dbh) provides the greatest plant and structural diversity, a high level of animal diversity, and a high level of woody debris (Brown 1985). Mature riparian zones also contribute to a high level of aquatic diversity and provide primary habitat for several wildlife species (see Wildlife section). Standing riparian vegetation helps regulate water temperature through shading and provides major life requirements (e.g., nesting, roosting, cover habitat and food sources) for a variety of terrestrial and aquatic animals (Brown 1985). Mature riparian vegetation has the structural components to maintain water quality, reduce peak flood flows, control erosion, and increase ground water recharge. Downed riparian vegetation in a floodplain, supplied by mature trees in the riparian zone, provides terrestrial animal cover and food, dissipates water energy, traps sediment, increases water storage, changes flow patterns, and maintains and improves aquatic habitat conditions.

Table 3-26 displays the existing condition of riparian habitat and explains the tree sizes upon which condition classes are based. In general, riparian conditions have been degraded by road construction and forest management practices. Approximately 37 percent of riparian areas are in minimal condition, with the average tree size less than 11 inches dbh. Approximately 48 percent of the riparian zone acres are in good to optimal condition with the average tree size being greater than 21 inches in dbh.

Table 3-25. Existing Condition of Riparian Zones on BLM-Administered Land

	Riparian Condition Class[1] (in Acres)					
Stream Order	1	2	3	4	5	Total
3	1,290	1,383	984	2,563	630	6,850
4	594	1,015	661	1,837	425	4,532
5	375	559	461	1,132	297	2,824
6	70	239	267	659	178	1,413
7	148	297	200	269	3	917
8	0	0	0	0	0	0
9	0	0	11	50	0	61
Total	2,477	3,493	2,584	6,510	1,533	16,597

[1] Riparian condition class equates to size of trees (dbh) in riparian zones:

Class 1 (minimal condition)	= 0-5 inch trees
Class 2 (minimal condition)	= 6-11 inch trees
Class 3 (fair condition)	= 12-21 inch trees
Class 4 (good/optimal condition)	= 21+ inch trees
Class 5 (good to optimal condition)	= 28+ inch trees

Table 3-26. Existing Condition of Riparian Habitat on BLM-Administered Land

	Riparian Condition Class [1] (in Miles)					
Stream Order	1	2	3	4	5	Stream Miles
3	62	65	46	122	30	325
4	20	35	23	63	15	156
5	9	13	11	26	6	65
6	2	5	6	14	4	31
7	3	7	5	5	<1	20
8	0	0	0	0	0	0
9	0	0	<1	1	0	1
Total	96	125	91	231	55	598

[1] Riparian condition class equates to size of trees (dbh) in riparian zones:

Class 1 (minimal condition)	= 0-5 inch trees
Class 2 (minimal condition)	= 6-11 inch trees
Class 3 (fair condition)	= 12-21 inch trees
Class 4 (good/optimal condition)	= 21+ inch trees
Class 5 (good/optimal condition)	= 28+ inch trees

Source: District timber inventory

Wildlife

Wildlife Within the Range of the Northern Spotted Owl

The *Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl*, and its Appendix A, (the *Report of the Forest Ecosystem Management Assessment Team* [FEMAT]1993) identified 191 animal species and 11 functional groups of arthropods closely associated with late-successional forests within the range of the northern spotted owl. This includes 102 species of mollusks, 18 species of amphibians, 7 fish, 38 bird species, and 26 species of mammals. The total number of species occurring within the range of the northern spotted owl is much greater.

Arthropods - Arthropods are a major source of biological diversity in late-successional forests in the Pacific Northwest. Arthropods inhabit these forests and assume numerous ecological roles that are important to ecosystem function (Olson 1992). Lattin estimates there are between 20,000 and 25,000 species of arthropods within the range of the northern spotted owl (SEIS 1994).

Arthropods inhabit virtually every part of the coniferous forest system including coarse woody debris, litter and soil layer, understory vegetation, canopy foliage, tree trunks, snags, and the aquatic system. The richness of arthropod species in late-successional forests suggests a great number of different processes and functions, but little is known about how arthropods interact, survive, and contribute to ecosystem function (SEIS 1994).

Mollusks - Mollusks represent a major source of biologic diversity in late-successional forests of the Pacific Northwest. Mollusk species of the Pacific Northwest are comprised of land snails, slugs, aquatic snails, and clams. As a group, they are diverse in number and function; many have restricted geographic ranges and narrow ecological requirements. Currently, approximately 350 species are known to occur in forests within the range of the northern spotted owl.

Land snails and slugs account for over 150 of the 350 species of mollusks. Most are found in moist forest environments and in areas around springs, bogs and marshes. Over 100 species are closely associated with late-successional forests.

Freshwater mollusks are found in permanent water bodies of all sizes. In the Pacific Northwest, spring-fed streams and pools often support the greatest abundance and diversity of both clams and snails (SEIS 1994).

Amphibians and Reptiles - The number of species of amphibians and reptiles in coniferous forests of the Pacific Northwest is small compared to the number of birds and mammals. However, amphibians and reptiles comprise a distinct and important component of the vertebrate fauna (Bury 1988). Approximately 62 species of amphibians are found in the Pacific Northwest, but fewer are found in coniferous forests. Of the 10 species of reptiles evaluated by Thomas et al. (1993) for their association with late-successional forests, none were found to be closely associated with this forest type.

Birds - The Assessment Team assessed 36 species of birds closely associated with late-successional and old-growth forests as identified in the "short list" of the Scientific Analysis Team Report (Thomas et al. 1993). Threatened and endangered species are discussed in the Special Status Species section.

The Assessment Team's list included three species (Vaux's swift, white-headed woodpecker, and chestnut-backed chickadee) that are broadly endemic to the Pacific Northwest. Twelve of the species are cavity-nesters (pileated woodpecker, white-headed woodpecker, three-toed woodpecker, black-backed woodpecker, hairy woodpecker, red-breasted sapsucker, Williamson's sapsucker, chestnut-backed chickadee, winter wren, red-breasted nuthatch, white-breasted nuthatch, and flammulated owl), that require snags for nesting and/or forage. Optimal habitat for cavity-nesters consists of old-growth forests where the occurrence of large snags is the greatest. Additional species of waterfowl, birds of prey, and passerines are also on the Assessment Team's list.

Mammals Other Than Bats - Temperate coniferous forests of the Pacific Northwest provide habitat for a diverse array of mammal species. The Assessment Team identified 15 mammal species or species complexes as being associated with late-successional forests. These include forest carnivores, elk, rodents, and insectivores.

These mammals interact and are interrelated with the late-successional and old-growth ecosystem.

Small mammals depend on fir needles, fungi, and lichens in coniferous forests; many are important prey for larger mammals. The foliage- and fungi-eating mammals have important functional roles in the coniferous forests. Hypogeous fungal spores are primarily dispersed by small mammals in their fecal pellets. Fecal pellets also contain nitrogen-fixing bacteria which are deposited onto the forest floor. These mammals also serve an important role in physically distributing lichens throughout the forest (FEMAT Report).

Bats - Bats are a diverse order of mammals. More species of bats may be in North American temperate forests than any other group of mammals. Because of their large population numbers, bats may play an important role in nutrient cycling within forests. All forest-dwelling bats in the Pacific Northwest are insectivorous. Bats that forage in riparian areas and fly upland to roost may serve as dispersers of nutrients. Bats also serve an important role as predators of insects (FEMAT Report).

Large snags and large green trees are important to bats for maternity roosts, day roosts, temporary night roosts, and hibernacula. Bats in the Pacific Northwest seem to prefer old forests, presumably due to more potential roost sites under bark, in crevices, or in hollows of large old trees. Suitable roost sites require access to water, protection from predators, and favorable temperature and moisture regimes (FEMAT Report).

See the FEMAT Report for a more detailed description.

Wildlife Within the Coos Bay District

There are about 380 vertebrate wildlife species known to occur within the planning area during some part of their life cycle. This includes 75 mammals, 261 birds, 22 reptiles and 19 amphibian species. Generally, populations of the various species on BLM-administered lands have not been inventoried, except for some special status species. Species which obtain at least one of their life cycle requirements (i.e., breeding, feeding, or resting) within the various seral stages and unique habitat types in the planning area are shown in Appendix T. The number of arthropods and their allies occurring within the Coos Bay District is not known.

This Wildlife section focuses on habitat for priority wildlife species including special status and several other important species. Special status species include federal threatened and endangered; federal proposed; federal candidate; state threatened and endangered; and BLM sensitive, tracking, and assessment species, as described in the Special Status Species section of this chapter. This section describes other priority species including important game and other species considered vulnerable to impacts from forest harvesting and other land management activities. These priority species are listed in Table 3-27 along with information on their habitat preferences and population levels.

Each priority species requires a specific set of habitat conditions which may be found within one or many of the plant communities and seral stages in the planning area. For example, osprey are found primarily in riparian, coastal areas and upland forests with snags, whereas black bears are associated with three special and unique habitats (riparian, snags, and dead/down), all five seral stages of the temperate coniferous forest, and hardwood forests.

Wildlife diversity is generally correlated with seral stage diversity (i.e., the greater the number of different seral stages and associated edges present within an area, the greater the number of wildlife species that are also present) (Brown 1985). As explained in the Vegetation section, each major plant community has the potential to produce a variety of seral stages ranging from early seral to old growth. Seral stages are always changing, progressing toward their climax stage. Plant communities in western Oregon normally progress toward a climax seral stage dominated by a western hemlock forest. Natural or human-related disturbances, such as fire and logging, have set succession back to an earlier stage in many areas. As a result, wildlife species requiring older seral stages are replaced by those species adapted to younger seral stages. For example, clearcutting old-growth and mature coniferous forests eliminates preferred habitat for species such as the northern spotted owl, red tree vole and northern flying squirrel but can create habitat for such species as the American kestrel, the creeping vole and western pocket gopher.

As long as all forest seral stages are maintained in appropriate quantities and in suitable condition, harvesting of timber contributes to a diversity of seral stages and habitats. Emphasis on harvesting old-growth forests, however, has resulted in a trend toward reduced amounts of older forest habitat and lower wildlife diversity (Harris 1984). Estimates of old growth on federal forest lands within or in proximity to the planning area are displayed in Table 3-28.

Table 3-27. Priority Animal Species in the Planning Area[1]

Species	Reason for Priority Status	Primary Habitat[2]	Population Level/Trend[3]
Osprey	HI[4]	d,e,f,h,i	Moderate/Stable
Great Blue Heron	HI	d,f,i	Low/Stable
Dominant Woodpeckers	HI	a,d,e,f,h,j,k	Low/Decreasing
Accipiters[5]	HI	c,d,e,f,k	Unknown
Roosevelt Elk	Game	a,b,c,d,e,f	High/Increasing
Black-tailed Deer	Game	a,b,c,d	Moderate/Decreasing
Black Bear	Game	a,b,c,d,e,f,h,j,k	High/Increasing
Mountain Lion	Game	a,b,d,f,g	Moderate/Increasing
Amphibians	HI	a,b,c,d,e,f,g,j,k	Unknown

[1] Does not include special status species.

[2] Includes breeding, feeding or resting sites within the following seral stages and special habitats (Brown 1985):
a = early seral
b = mid seral
c = late seral
d = mature
e = old growth
f = riparian
g = talus slope/cliff
h = snags
i = coastal
j = dead and down
k = hardwood

[3] Determined by district biologist based on field observations and consultation with other agencies. Population levels of many wildlife species are difficult to determine and therefore must be considered estimates only.

[4] HI = High interest and concern (species considered vulnerable to impacts from timber harvest and other management activities.)

[5] Includes sharp-shinned hawk, Cooper's hawk and northern goshawk.

Table 3-28. Old-Growth on Federal Forest Lands Within or in Proximity to the Planning Area

Planning Area[1]	Old Growth Acres	 Percent of Land Base
Coos Bay BLM	51,300	15
Eugene BLM	39,500	13
Roseburg BLM	103,800	25
Medford BLM	102,000	12
Siuslaw N.F.	33,800	5 [2]
Siskiyou N.F.	393,000	36 [3]

[1] Covers entire district/forest
[2] Final Environmental Impact Statement, Siuslaw National Forest, 1990
[3] Final Environmental Impact Statement, Siskiyou National Forest, 1989

According to Brown (1985) and local inventory records, approximately 84 wildlife species in the Coos Bay District find their primary habitat within old growth (Appendix T). Priority species which use these seral stages as primary habitat are identified in Table 3-27.

The reduction of mature and old-growth forest stages represents the most serious problem for wildlife in the planning area. Under the current BLM timber management plan, older forest habitat is being harvested at the average rate of approximately 3,400 acres per year. On private lands in the planning area, most older forest has been eliminated. Unharvested late-seral stage habitat, which amounts to 15 percent of the BLM-administered land base in the planning area, will not be available at the current rate of harvest to replace mature and old-growth forests scheduled for harvest. The loss of older forest has deprived some priority wildlife species of important habitat components. For example, optimum thermal cover for Roosevelt elk has declined as a result of reduction of older forest. Nesting areas for northern goshawks (an accipiter), pileated woodpeckers (one of the dominant woodpeckers), and great blue herons, and prey stalking areas for mountain lion (Harcombe 1976) have likewise declined. However, there is no data available to correlate habitat decline with population levels.

Early-, mid-, and late-seral stage conifer forests are the dominant habitat on BLM-administered lands within the planning area. In the Coos Bay District, 86 species use the early-seral stages as primary habitat, 62 use the mid seral and 43 use the late seral. Priority species which use these seral stages as primary habitat are shown in Table 3-27. Major wildlife problems associated with these habitats are related more to habitat quality (e.g., stand characteristics, landscape patterns, extent of road construction) than to habitat quantity. For example, inadequate interspersion of cover and forage and excessive road construction have adversely affected big game populations (Brown 1985). Adjacent private lands contribute additional forage and escape cover but very little optimal thermal cover. Another example of management that impacts wildlife habitat is commercial thinning of young stands which reduces dense nesting habitat required by accipiters (Reynolds 1983). A long-term habitat problem associated with early-to-late seral stages is reduced complexity in vertical and horizontal vegetation structure resulting from intensive forest management practices (i.e., short harvest rotation, thinning, and slash burning).

Other habitats within the planning area have have been impacted by forest management include snags, dead and down wood, riparian zones, and special habitats such as dry meadows, cliffs and talus slopes, wetlands, and hardwoods.

Snags are of special concern because they provide primary habitat for 51 species of birds and mammals (Appendix T). Priority bird species that use snags as primary habitat are the osprey and dominant woodpeckers. Cavity-nesting birds (including woodpeckers and secondary cavity users) feed on insects and play an important role in control of forest insect pests (Brown 1985). Under natural conditions, snags occur throughout the forest when trees die due to natural suppression, fire, insects and disease. However, logging and current safety and fire prevention measures have resulted in the elimination of most snags in the logged areas in the planning area. Current populations of the five dominant woodpeckers (hairy, downy, pileated, red-breasted sapsucker, and northern flicker) within the planning area are estimated to be at 40 percent of potential. Six species of cavity users (house wren, Bewick's wren, violet-green swallow, tree swallow, western bluebird and purple martin) prefer early seral stages resulting from timber harvesting when wildlife trees are present. Wildlife tree surveys (includes the tallying of snags and live trees reserved for wildlife) during the past decade revealed a range of 0.9 to 1.8 wildlife trees per acre on recent clearcut and burned areas. Some of these wildlife trees are small diameter (less than 15 inches) snags or live trees, and some are soft snags which do not provide long-term snag habitat.

Recent concerns have been expressed for species requiring large, dead-and-down wood on the forest floor (Maser and Trappe 1984, Maser et al. 1988). There are 59 species in the Coos Bay District that find their primary habitat in dead-and-down wood (Appendix T). Market conditions and intensive forest management practices such as short harvest rotations (i.e., 80 years or less), slash burning, and thinning have reduced the amount of this habitat (Maser and Trappe 1984). Although effects on species requiring this habitat are largely unknown, Noble et al. (1990) recently found that black bears in the central Coast Range of Oregon prefer large rootwads as denning sites.

Riparian zones are also of special concern (see Riparian section), particularly since they provide habitat for 184 species of wildlife (Appendix T). Priority species that use riparian zones as primary habitat are shown in Table 3-27. Although the third order and larger streams are buffered from most logging activity, timber harvesting on BLM-administered lands has changed riparian habitat on many first and second order headwater streams and even some of the buffered streams throughout the planning area. Amphibians such as the Southern torrent salamander and tailed frog depend on cool, clear water found in these streams.

Special habitats (e.g., cliffs, talus, wet meadows, dry meadows, wooded swamps and bogs) provide elements of forest diversity important to many wildlife species (Appendix T). Priority species that use these special habitats as primary habitat are shown in Table 3-27. For example, black bear and Roosevelt elk use wet meadows as forage and resting areas, and mountain lions use cliffs and other rocky areas as hunting, denning and resting areas (Harcombe 1976). Timber harvest activities including road construction and yarding, and other activities such as quarry development, off-highway-vehicle (OHV) use, and communication site developments have removed cover and created disturbances in many special habitats, making them less valuable as habitat.

Hardwoods provide primary habitat for 104 species of wildlife in the planning area (Appendix T). Because of their lower economic value in comparison to conifers, hardwood stands have been converted to conifer stands, and hardwoods in plantations have been cut to allow conifers to grow with less competition. In contrast, the number of hardwoods have increased in disturbed and wet sites. The practices of stand conversion and conifer release, although limited in extent and success in the Coos Bay District, have contributed toward the dominance of monotypic, even-aged stands of second-growth conifers in portions of the planning area. Pacific slope flycatchers, black-headed grosbeaks, screech owls and other hardwood-oriented species have likely been affected by the conversion of hardwoods.

Shrubfields are an important landscape component and provide unique habitats for many birds, such as neotropical migrants and some early-successional species, as well as foraging areas for large mammals when adjacent to older forest stands.

Table 3-29 summarizes the numbers of species in the Coos Bay District using selected habitats.

Table 3-29. Summary of Species Using Selected Habitats as Primary Habitat in the Coos Bay District

		Special and Unique Habitats					Temperate Coniferous Forest					
Major Group	Total # Species	Coastal	Riparian Wetland	Cliffs/ Talus	Snags	Dead/ Down	Early Seral	Mid-Seral	Late Seral	Mature	Old-Growth	Hardwood Forest
Amphibians & Reptiles	38	5	23	8	0	23	14	13	10	8	7	17
Birds	260	134	120	16	37	9	33	23	14	44	51	52
Mammals	72	13	37	14	14	26	33	25	17	27	24	33
Total	**370**	**152**	**180**	**38**	**51**	**58**	**80**	**61**	**41**	**79**	**82**	**102**

Fish

Streams, rivers, and other water bodies in the planning area contain substantial habitat for numerous fish species, especially salmon and trout. These aquatic habitats meet at least one of the life-cycle requirements (i.e., spawning, rearing, or passage) for more than 30 species of native and introduced non-salmonid fish and 6 species of salmon and trout (see Appendix III-G of the Draft RMP). The descriptions and analyses in this RMP focus on four priority fish species—chinook and coho salmon, steelhead and cutthroat trout.

Of the 598 miles of perennial streams on BLM-administered land within the planning area, 140 miles of streams and rivers contain resident fish and 216 miles support anadromous salmon and trout (see Map 3-4). Seventeen miles of stream above natural or human-made barriers have suitable habitat for anadromous salmonids. Cutthroat trout are also found in Wassen Lake that has five total surface acres.

Analysis of stream conditions by the district fish biologist revealed that approximately 36 percent of stream habitat on BLM-administered lands is in minimal condition, 17 percent in fair condition, and 47 percent in good to optimal condition (see Table 3-30). See Appendix III-H of the draft RMP for methodology used in rating the quality of stream habitat. Generally, fifth and sixth order streams are in a better state of recovery than third and fourth order streams. Management activities on the larger fifth and sixth order streams occurred earlier than on the smaller streams as development penetrated the coastal drainages.

Habitat condition trends and wild fish population levels and trends are also shown in Table 3-30. (Wild population refers to those fish that are naturally-spawning.) Of the 356 miles of stream on BLM-administered land inhabited by cutthroat trout, 36 percent are in minimal condition and 49 percent are in good to optimal condition. For steelhead, 37 percent of the 192 miles are in minimal condition and 45 percent are good to optimal condition. For coho salmon, 38 percent of the 176 miles are in minimal condition and 44 percent are good to optimal condition. For chinook salmon, which are found in larger streams, 31 percent of the 41 stream miles are in minimal condition and 42 percent are in good to optimal condition.

The potential of a stream to support fish production is directly related to the quantity and quality of aquatic habitat, which in turn is closely associated with the condition of the riparian area. Historic changes in riparian areas, including removal of conifers in riparian and upslope areas, has considerably reduced the potential productivity of most streams. Having fewer large trees in riparian areas has resulted in less instream woody structure, water storage, channel complexity and stability, and suitable water temperatures. Improved riparian and stream channel protection on BLM-administered lands over the last ten years have allowed many stream segments to begin recovering. Full recovery of some streams is not expected for 200 years. As riparian and stream channels continue to improve, the productive capability of fish habitat will also improve.

State Sensitive Fish Species

Five species of fish in the planning area are on the state's sensitive species list. The Millicoma longnose dace, *Rhinichthys cataractae*, has recently been located in Tioga Creek, a tributary of the South Fork Coos River. Oregon Department of Fish and Wildlife biologists are currently conducting studies on population estimates and distribution of the species. Coho salmon, *Oncorhynchus kisutch*, (south coast-all coastal populations south of Bandon); fall chinook salmon, *Oncorhynchus tshawytscha*, (south coast-all coastal populations south of Bandon except those Rogue River populations upstream of Agness); and chum salmon, *Oncorhynchus keta*, (Coos and Umpqua River populations) are on the state sensitive species list. Coho salmon, *Oncorhynchus kisutch,* (Coos River populations) and spring chinook salmon, *Oncorhynchus tshawytscha*, (Coquille River populations) are on the state's list for stocks of concern, which indicates a probability for future inclusion on the sensitive species list. Pacific lamprey, *Lampetra trientata*, is on the state vulnerable list. The Pacific lamprey is found in all coastal streams.

In addition to the above, there are some salmonid stocks of fish on the planning area that are not on the state sensitive species list, but are considered by the American Fisheries Society to be depleted in the Pacific Northwest (AFS 1991). This includes: Sea-run cutthroat trout, *Oncorhynchus clarki* (all Oregon coastal populations); Fall chinook salmon, *Oncorhynchus tshawytscha*, (Coos and Pistol Rivers); Coho salmon, *Oncorhynchus kisutch*, (Umpqua, Coos and Coquille Rivers); Chum salmon, *Oncorhynchus keta* (Sixes and Elk Rivers); and summer steelhead, *Oncorhynchus mykiss* (Rogue River).

The National Marine Fisheries Service has received petitions under the Endangered Species Act for the listing of steelhead and coho salmon for all coastal streams in the district.

Table 3-30. Habitat Conditions and Population Levels of Priority Fish Species on the Coos Bay District [1]

Priority Species	Stream Miles	Condition of Habitat Miles [2]			Current Trend [3]	Wild Population	
		Minimal	Fair	Good/Optimal		Level [4]	Trend [3]
Chinook	41	13	11	17	+	M	0
Coho	176	67	32	77	+	L	-
Steelhead	192	71	35	86	+	L	-
Cutthroat	356	127	54	175	+	L	-

[1] Habitat and population data are for streams on BLM-administered lands only.

[2] See Appendix III-H of the draft RMP for methodology of rating the stream habitat quality

[3] + = increasing/improving
- = decreasing/declining
0 = stable

[4] H = high
M = medium
L = low

Ratings are in relation to 10-year average population levels.

Sources: Stream inventories (150 miles) conducted by the district fish biologist and by ODFW; WODDB; and a related factors analysis (i.e., verification of tree size as an indicator of habitat condition) completed by the district fish biologist.

Special Status and SEIS Special Attention Species

Introduction

The Fish and Wildlife Service and National Marine Fisheries Service provided a list of 39 federally-listed and proposed species which may occur in the range of the northern spotted owl. Eleven of those species occur on the Coos Bay District. Further, 3 of those 11 species have habitat associations known to include late-successional forest or be directly associated with such habitat. Some of the 39 listed and proposed species were eliminated from detailed discussion in the *Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* (SEIS), and likewise in this PRMP/EIS, for one of three reasons:

- They are not known to occur on the Federal lands within the range of the northern spotted owl.
- They do not inhabit coniferous forests.
- Their presence in the spotted owl's range is transitory or unaffected by forest management activities.

The alternatives considered in the SEIS will have no effect on these species.

Appendix A to the SEIS, the *Forest Ecosystem Management: An Ecological, Economic, and Social Assessment* (FEMAT 1993) identified some "species that are not restricted to only late-successional forests or that are associated with unique or special habitats that may be considered late-successional, but which may be affected by forest management activities." Nine species in the FEMAT assessment are not known to occur on the Coos Bay District. Those species are: grizzly bear, gray wolf, Sacramento River winter chinook salmon, Snake River fall chinook salmon, Snake River spring/summer chinook salmon, Snake River sockeye salmon, Klamath short-nosed sucker and Lost River sucker, and MacDonald's rockcress. (See the FEMAT Report for more information.) These species also will not be addressed in this PRMP.

Species limited in abundance and distribution, and which have identifiable threats to their existence, are considered to be special status species. The categories of special status species are:

- Federal threatened and endangered
- Federal proposed
- Federal candidate (Category 1 and 2)
- State threatened and endangered
- Bureau sensitive
- Bureau tracking
- Bureau assessment
- SEIS special attention

Plants

Special status plant lists are amended as inventory and monitoring data provide more information. Since 1980, approximately 64,000 acres (19 percent) of the district have been inventoried for special status plants. Currently, 24 special status plant species have been documented at 90 occurrences on the district, totaling approximately 620 acres. Of these 90 occurrences, 42 are located in existing or proposed special areas, some of which are designated to protect the special status plants.

The majority of special status plants in the planning area occur in the Myrtlewood Resource Area. This area includes the western edge of the Siskiyou Mountains which have a unique geologic and climatic history that provides unique habitats for many endemic species. Special status plants occur in a variety of habitats including salt marshes, beaches, coastal headlands, and serpentine meadows and bogs.

Special status plant inventories occur prior to any planned activity such as timber sales, land exchanges, riparian projects and recreational developments. Research and monitoring have been implemented for two federal candidate species (salt-marsh bird's-beak and silvery phacelia). When special status species are located within planned project areas, the sensitive sites are given protection either by modifying or dropping the action (i.e., dropping a timber sale unit) or mitigating the negative effects (i.e., buffering).

As of June 1994, no federally-listed or proposed plant species occur on BLM-administered lands in the Coos Bay District. There are a total of 77 special status plant species (including bryophytes, lichens and fungi) known or suspected to occur on BLM-

Table 3-31. Special Status Plant Species (Including Bryophytes, Lichens and Fungi) Known or Suspected to Occur in the Coos Bay District

Scientific Name	Common Name	D/S	Status
Vascular Plants			
Abronia latifolia	yellow sandverbena	D	TS
Abronia umbellata ssp. *breviflora*	pink sandverbena	D	FC(2), SE
Adiantum jordanii	California maidenhair	D	TS
Allium bolanderi	Bolander's onion	D	AS
Arctostaphylos hispidula	hairy manzanita	D	AS
Aster vialis	wayside aster	S	FC(2)
Astragalus umbraticus	woodland milkvetch	S	AS
Bensoniella oregona	Bensonia	D	FC(2)
Brodiaea terrestris	dwarf brodiaea	D	AS
Cardamine gemmata	purple toothwort	S	FC(2)
Carex gigas	Siskiyou sedge	S	AS
Castilleja ambigua var. *ambigua*	johnny-nip	D	TS
Cicenda quadrangularis [1]	microcala	D	AS
Cochlearia officinalis	spoonwort	S	AS
Cordylanthus maritimus ssp. *palustris*	salt marsh birds-beak	D	FC(2)
Cyperus rivularis	shining cyperus	S	TS
Cypripedium californicum	California lady's-slipper	D	TS
Cypripedium fasciculatum	clustered lady's-slipper	D	BS
Darlingtonia californica	California pitcher-plant	D	TS
Dichelostemma ida-maia	firecracker flower	S	TS
Dudleya farinosa	seacliff stonecrop	D	TS
Dulichium arundinaceum	dulichium	D	TS
Erigeron cervinus	Siskiyou daisy	S	AS
Eriophorum chamissonis	russet cotton-grass	D	AS
Erysimum concinnum	Pacific wallflower	S	AS
Erythronium revolutum	coast fawn-lily	D	TS
Gentiana setigera	Waldo gentain	D	FC(2)
Haplopappus arborescens	golden fleece	D	AS
Hieracium bolanderi	Bolander's hawkweed	D	AS
Hydrocotyle verticillata	whorled marsh pennywort	S	AS
Iliamna latibracteata	California globe mallow	D	AS
Lasthenia macrantha ssp. *prisca*	large flowered goldfields	D	FC(3C)
Lathyrus delnorticus	Del Norte pea	D	TS
Lessingia filaginifolia ssp. *californica*	beach-aster	D	TS
Lilium occidentale	western bog lily	S	PE, SE
Limonium californicum	sea-lavender	D	AS
Lycopodiella inundata [1]	bog club-moss	D	AS
Microseris bigelovii	coast microseris	S	AS
Mimulus douglasii	Douglas' monkeyflower	D	TS
Monardella purpurea	Siskiyou monardella	D	AS
Oenothera wolfii	Wolf's evening primrose	D	FC(1)
Ophioglossum pusillum	Adder's-tongue	S	AS
Phacelia argentea	silvery phacelia	D	FC(2)
Phacelia verna	spring phacelia	D	TS
Poa piperi	Piper's bluegrass	D	AS
Polystichum californicum	California swordfern	D	AS
Romanzoffia thompsonii	Thompson's mist-maiden	D	BS
Salix delnortensis	Del Norte willow	S	AS

Table 3-31. Special Status Plant Species (Including Bryophytes, Lichens and Fungi) Known or Suspected to Occur in the Coos Bay District (continued)

Scientific Name	Common Name	D/S	Status
Vascular Plants			
Scirpus subterminalis	water clubrush	S	TS
Sidalcea cusickii	Cusick's checkermallow	D	TS
Sidalcea hendersonii	Henderson's sidalcea	S	AS
Sidalcea malacroides	maple-leaved sidalcea	S	AS
Sidalcea malvaeflora ssp. *patula*	spreading checker mallow	D	BS
Tofieldia glutinosa ssp. *glutinosa*	sticky tofieldia	S	TS
Triglochin striata	three-ribbed arrow-grass	S	TS
Trillium angustipetalulm [1]	giant purple trillium	D	AS
Triteleia hendersonii var. *leachiae*	Leach's brodiaea	D	BS
Triteleia laxa	Ithuriel's spear	S	AS
Viola primulifollia ssp. *occidentalis* [1]	western bog violet	S	BS
Bryophytes (Mosses and Liverworts)			
Calypogeia sphagnicola	liverwort	S	AS
Campylopus aureus	moss	S	AS
Encalypta brevicolla var. *crumiana*	moss	S	BS
Limbella fryei	moss	S	BS
Racomitrium pacificum	moss	S	AS
Triquetrella californica	moss	S	TS
Lichens and Fungi			
Bryoria pseudocapillaris	lichen	D	AS
Buellia oidalea	lichen	S	TS
Caloplaca stantonii	lichen	S	AS
Cladidium bolanderi	lichen	S	TS
Erioderma sorediatum	lichen	S	AS
Lecanora caesiorubella ssp. *merrillii*	lichen	S	TS
Leioderma sorediatum	lichen	S	AS
Neibla cephalota	lichen	D	TS
Pseudocyphellaria mougeotiana	lichen	S	AS
Schismatomma californicum	lichen	S	TS
Teloschistes flavicans	lichen	D	TS
Usnea rubicunda	lichen	S	TS

Abbreviations used in this table:

D = Documented	S = Suspected
AS = Assessment Species	BS = Bureau Sensitive
SE = State Endangered, listed	PE = Proposed Endangered
FC = Federal Candidate	TS = Tracking Species

[1] Reflects name change since publication of draft RMP.

NOTE: for explanation of status categories, see footnote on Table 3-32.

administered lands in the district (see Table 3-31). The federal candidate plant species occurring in the planning area are described below. Western bog lily, a federally proposed species, is also described due to the potential likelihood of its presence on BLM-administered land.

Pink Sandverbena (*Abronia umbellata* ssp. *breviflora*)

Pink sandverbena is currently listed as a federal candidate, category 2 (1990 Federal Register Notice of Review) by the U.S. Fish and Wildlife Service. The State of Oregon has listed this species as endangered (1991 OAR 603-73-070[1]). Pink sandverbena is an annual belonging to the *Nyctaginaceae* (Four O'clock) family.

The historical range of this species extended from British Columbia to California. It has been extirpated from British Columbia and Washington, with only a few sites known in Oregon and California. The habitat of pink sandverbena is beaches above the high tide line in soft sand. Much of this species habitat has been altered by the introduction of European beachgrass (*Ammophila arenaria*). A population of this species has recently been introduced on BLM-administered land in coordination with the Oregon Department of Agriculture and Army Corp of Engineers, and one is being proposed for New River ACEC. Habitat for this species occurs at New River and the North Spit of Coos Bay. Inventories for this species began in 1990 and are continuing.

Bensonia (*Bensoniella oregana*)

Bensonia is presently listed as a federal candidate, category 2 (1990 Federal Register Notice of Review) by the U S. Fish and Wildlife Service. The State of Oregon has listed this species as a candidate for listing as State threatened or endangered. Bensonia is a perennial in the *Saxifragaceae* (Saxifrage) family.

This species' range includes the Siskiyou Mountains of southwestern Oregon and northwestern California. Its habitat is along the edges of meadows, springs, or bogs in mixed coniferous forests (Meinke 1980). This species was previously thought to occur above 4,000 feet, but two populations were located in 1992 on the Coos Bay District at an elevation of 2,200 feet. These two populations appear to be the most northerly known populations. Inventory for this species began in 1992.

Salt marsh bird's-beak (*Cordylanthus maritimus* ssp. *palustris*)

Salt marsh bird's-beak is presently a federal candidate, category 2 (1990 Federal Register Notice of Review) by the U.S. Fish and Wildlife Service. The State of Oregon has recently proposed this species as State threatened (1991 OAR 603-73-040). Salt marsh bird's-beak is an annual belonging to the *Scrophulariaceae* (figwort) family.

The range of this species extends from California to Oregon, with the majority of populations occurring in the Coos Bay estuary. Habitat for salt marsh bird's-beak are salt marshes along the coast. Inventory for this species began in 1990, and monitoring to determine population trends began in 1991 and is continuing. All habitat on BLM-administered lands have been inventoried. The BLM manages one population of salt marsh bird's-beak on the North Spit. This population is important as it shows some genetic differences from other populations by having plants with two color forms. No other known population shows this genetic difference. The BLM population declined from 1990 to 1992 (Kaye 1992) but has since remained stable.

Waldo gentian (*Gentiana setigera*)

Waldo gentian is currently listed as a federal candidate, category 2 (1990 Federal Register Notice of Review) by the U.S. Fish and Wildlife Service. The State of Oregon has listed this species as a candidate for listing as State threatened or endangered (1991 OAR 603-73-080). Waldo gentian is a perennial in the *Gentianaceae* (Gentian) family.

This species is an endemic to the Siskiyou Mountains of southwestern Oregon and northwestern California. The habitat for Waldo gentian are serpentine bogs and springs. Initial inventories began in 1992 to determine the status of this species within the planning area. The BLM currently has two populations which appear to be stable. These two populations are the most westerly known populations.

Western bog lily (*Lilium occidentale*)

Western bog lily has been proposed for listing under the Endangered Species Act (1992 Federal Register). The State of Oregon has listed this species as endangered (1991 OAR 603-73-070[1]).

Western bog lily is a perennial belonging to the *Liliaceae* (Lily) family. Currently there are no known populations occurring on BLM-administered land.

The range of western bog lily is along the southern Oregon and northern California coasts. The habitat for this species is along the edges of coastal bogs, within two miles of the ocean. Ballantyne (1980) stated that the 20-mile stretch of coast between Bandon and Cape Blanco probably held the majority of populations of western bog lily in Oregon. Included in this area is the New River ACEC. Inventories for this species began in 1991 and are continuing. A project to experimentally introduce this species at New River is currently being developed.

Wolf's evening-primrose (*Oenothera wolfii*)

Wolf's evening-primrose is currently listed as a federal candidate, category 1 (1990 Federal Register Notice of Review) by the U.S. Fish and Wildlife Service. The State of Oregon has recently proposed this species as State threatened (1991 OAR 603-73-040). Wolf's evening-primrose is a biennial or perennial in the *Onagraceae* (evening-primrose) family.

This species' range is from the southern Oregon to northern California coasts. Habitat for this species includes the bases of coastal bluffs and headlands, typically on the south-facing side. Inventories for this species began in 1992 with two populations being located on BLM-administered lands. All potential habitat occurring on BLM-administered land has been inventoried.

Silvery phacelia (*Phacelia argentea*)

Silvery phacelia is listed as a federal candidate, category 2 species (1990 Federal Register Notice of Review) by the USFWS. The state of Oregon has listed this species as a candidate for listing as threatened or endangered (1991 OAR 603-73-080). Silvery phacelia is a perennial in the *Hydrophyllaceae* (waterleaf) family.

The range of silvery phacelia is the southern Oregon to the northern California coasts. Habitat for this species includes sandy beaches, stabilized sand dunes, and coastal headlands. Two populations are on BLM-administered lands. Inventory for this species began in the 1980s, and monitoring for population trends and habitat was implemented in 1992.

SEIS Special Attention Species

Lichens, Bryophytes, and Fungi

Lichens, bryophytes (mosses, liverworts, and hornworts) and fungi occur throughout the Coos Bay District in all habitat types. The distribution and abundance of these species on the district has not been well documented. Previous botanical surveys have looked primarily at vascular plants, but now include lichens, bryophytes, and fungi. Recently some lichen and bryophyte species have been identified, but more widespread inventories are needed to determine abundance and distribution. The primary reason for this information gap is a lack of expertise in identification of lichens, bryophytes, and fungi.

In 1993, some inventories for lichens were conducted in known localities of species listed in the Oregon Heritage Data Base, special areas, and representative old-growth stands. These inventories were very general in nature, but some information regarding lichen diversity and habitat information was learned. No inventories or research have yet been initiated for lichens, bryophytes and fungi within the Coos Bay District. Chapter 2 outlines the proposed future management actions concerning lichens, bryophytes and fungi.

Lichens, bryophytes and fungi are a conspicuous component of the ecosystem and provide a wide array of important ecosystem functions. The FEMAT Report (1993) lists several of these, all of which are relevant for species within the Coos Bay District.

Lichens have a diverse role in many ecosystems. Some forest lichens, such as *Lobaria oregana*, fix atmospheric nitrogen, making it available for other plants to use (Denison 1973). Lichen litterfall is an important source of nitrogen, providing organic material, and helping increase the soil moisture-holding capacity. They are also critical in providing habitat and food for many canopy-dwelling invertebrates and are also used by birds and small mammals for nest-building materials, food and camouflage (Maser et al. 1985, Broad 1989). Lichens are sensitive to sulfur dioxide and other gases and are currently being used in many air quality studies (McCune 1988). Some lichen species show antibiotic and medicinal properties (Hale 1974); some are being used in the floral and craft industry; and others are a source of natural dyes.

The bryophytes also are important in many ecosystems. They are important in contributing large amounts of biomass and are important in nutrient cycling (Brown and Bates 1990). Bryophytes intercept, absorb, buffer nutrients and water, and play an important role in the dynamics of forest understory vegetation, as well as soil structure and stability, and in the retention of water. They also provide food and habitat for a number of invertebrates and vertebrates. Flying squirrels and birds (including marbled murrelets) use bryophytes as nest materials. Some mosses are important Special Forest Products, being collected for the floral industry.

Although inconspicuous, fungi play a major role in all ecosystems including: nutrient cycling, soil aggregation, mycorrhizal associates, diseases, and important food source for many species (Molina 1994). Fungi are important in nutrient cycling, by the breaking down of coarse woody debris, making essential nutrients available for many other species to use. Fungal mycelium increase soil aggregation which is important in soil porosity and stability. Many fungi are mycorrhizal with forest plant species (including most trees) which increases forest health and productivity. Some fungal species cause diseases which are beneficial in creating small disturbances in forest communities which provide habitat for other species (cavity nesters). Fungi are an important food source for many invertebrates and vertebrates (including flying squirrels, which are the main prey for northern spotted owls). Specific fungi, such as chantrelles, are important Special Forest Products.

Because of reductions in acres of mature and old-growth forest, emphasis is being given to the management and inventory of lichens, bryophytes and fungi which are suspected to be found in these ecosystems. Species that are considered in need of special management and inventories are listed in Appendix G. It is currently not known whether the majority of those species listed in Appendix G occur within the Coos Bay District.

Although complete species lists have not been fully developed for lichens, bryophytes and fungi, it is clear that these species are important organisms within the district. Specific habitat features and ecological processes known to be important for supporting these organisms in late-successional forests were identified in the FEMAT report (1993). These features and processes occur within the Coos Bay District.

Late-successional forests are critical for the maintenance of many species of lichens, bryophytes and fungi. Small fragments (5-40 acres) of old growth are important for the maintenance of these organisms. Forest fungi and bryophytes rely on coarse woody debris for a substrate and a source of moisture. Diversity of these organisms is highest where a variety of tree species form diverse plant communities and complex forest structure. For example, old-growth conifers with emergent crowns and large limbs support diverse lichen and bryophyte communities (McCune 1993, Neitlich 1993). Actions such as the retention of legacy trees may be an important source for many lichen species to colonize surrounding younger forests.

Various forest processes are also important for the maintenance of these organisms. Small scale disturbances such as the formation of forest gaps produce diverse stand structure, which is important in the development of microsites for lichens, bryophytes and fungi. In contrast, some lichen species rely on stable forest conditions where disturbance events, such as wildfire, have been absent for several hundred years.

Special habitats including riparian areas, rock outcrops, seeps, springs, hardwood forests, coastal dunes and forests, are all important habitats for maintaining the diversity of lichens, bryophytes and fungi within the district.

Species diversity increases for lichens and bryophytes (McCune 1993, Neitlich 1993) and fungi (FEMAT 1993) as forest ecosystems mature toward late-successional conditions. Many species found in older forests do not survive or compete well in younger forests. For some of these species, it may take over 200 years of stand development for them to become established (Lesica et al. 1991, Goward 1992). Early-successional forests are important, however, in supporting other lichens, bryophytes and fungi species. Changes in light, moisture, duff layers and a host of other environmental and physical factors will determine which species will be present. Forests of approximately 50 to 100 years old, for example, can provide habitat for the chantrelle, a popular edible mushroom. Ecosystem processes, resulting in early seral conditions, are also significant factors shaping the species composition of a given area. In general, however, the abundance of younger forests within the Coos Bay District and the species that rely on these conditions, including early to mid-seral lichens, bryophytes and fungi, are thought to be abundant and well distributed throughout the district. Appendix J2 of the SEIS outlines information regarding all the lichens, bryophytes and fungi.

Vascular Plants

Those SEIS vascular plants identified as needing special management attention are identified in Appendix G. Two species have been documented on the Coos Bay District: candy stick (*Allotropa virgata*) and clustered lady's-slipper (*Cypripedium fasciculatum*). Six other species are suspected to occur within the district, but have not been documented.

Some of these species, including *Aster vialis* and *Cypripedium fasciculatum*, are being managed under the BLM Special Status Plant Species Program. The district has been surveying for these species in recent years.

Animals

Appendix T lists special status animals known or suspected to occur in the planning area and their status category.

A few of the species on the federal list (i.e., endangered, threatened, proposed, and candidate) are not known to occur on BLM-administered lands, but may occur within the planning area. Examples include the Gold Beach and Pistol River pocket gophers, marine turtles and mammals, and invertebrates. Marine turtles, mammals, and birds have a low probability of occurrence in the planning area except in the tidal areas on the North Spit of Coos Bay and New River. There is little documentation on the occurrence of invertebrate species within the planning area. In fact, almost nothing is known about the range and abundance of federally-listed invertebrate species within the planning area.

In contrast, many other special status species are known to occur on BLM-administered lands, although in some cases their distribution and abundance is poorly documented. Examples of these species include south coast runs of coho and fall chinook salmon, Southern torrent salamander, tailed frog, northern goshawk, pileated woodpecker, black-backed woodpecker, western bluebird and American marten. Species known or likely to occur within the planning area, but not documented on BLM-administered lands, include chum salmon, sharptail snake, fork-tailed petrel, and fisher.

All Bureau assessment species on Table 3-32 are likely to occur within the planning area's boundaries.

Species listed as federal threatened, endangered, and candidates that are known to occur within the planning area (see Table 3-32) are discussed more indepth because of their current high relevance for RMP/EIS-related issues and forthcoming decisions.

Peregrine Falcon (*Falco peregrinus anatum*)

The peregrine falcon, a federal endangered species, is a cliff-nesting species preferring tall cliffs with ledges, potholes or small caves suitable for constructing a nest scrape (USFWS 1982). Areas frequented by shorebirds, pigeons, and waterfowl provide ideal feeding areas for peregrines.

Examination of potential peregrine habitat in the district has identified no peregrine nests on BLM-administered lands. Peregrine sightings during the fall, winter and spring months are thought to be migrant and wintering birds.

A Pacific Coast Recovery Plan for the peregrine falcon (USFWS 1982) is in the implementation phase.

Brown Pelican (*Pelecanus occidentalis*)

Little is known locally about the brown pelican, which is a federally-listed endangered species, as no intensive district inventories have been completed. Several have, however, been observed in the New River and North Spit areas. Most observations have been birds flying and feeding in the ocean or the bay. On several occasions, brown pelicans have been observed resting in New River. There is no known nesting north of southern California, but birds wander up and down the coast, most typically in summer.

Northern Spotted Owl (*Strix occidentalis caurina*)

The northern spotted owl is a federally-listed threatened species. An estimated 70 percent of the planning area has been inventoried at varying levels for northern spotted owls since 1976. Original studies focused on inventorying habitat for the presence of the species. However, in the mid-1980s, inventory efforts were intensified and began shifting to monitoring the occupancy of habitat and reproductive rates of owl pairs throughout the planning area. Since 1986, inventory has included capture and leg banding of spotted owls. As of 1992, a total of 98 spotted owl sites were identified in the planning area (see Map 3-5).

Table 3-32. Special Status Animal Species Known or Suspected to Occur in the Coos Bay District

Scientific Name	Common Name	Status[1] Federal	State
Birds			
Gavia immer	Common Loon	BA	—
Podiceps auritus	Horned Grebe	BT	SP
Podiceps grisegena	Red-necked Grebe	BS	SC
Oceanodroma furcata	Fork-tailed Storm-petrel	BA	SV
Pelecanus occidentalis	Brown Pelican	FE	SE
Casmerodius albus	Great Egret	BT	SU
Egretta thula	Snowy Egret	BA	SV
Branta canadensis leucopareia	Aleutian Canada Goose	FT	SE
Branta canadensis minima	Cackling Canada Goose	BT	—
Branta canadensis occidentalis	Dusky Canada Goose	BT	—
Aythya collaris	Ring-necked Duck	BT	—
Aythya affinis	Lesser Scaup	BT	—
Histrionicus histrionicus	Harlequin Duck	FC2	SP
Bucephala albeola	Bufflehead	BA	SP
Elanus leucurus	White-tailed Kite	BT	—
Haliaeetus leucocephalus	Bald Eagle	FT	ST
Accipiter gentilis	Northern Goshawk	FC2	SC
Falco columbarius	Merlin	BA	—
Falco peregrinus	Peregrine Falcon	FE	SE
Oreortyx picta	Mountain Quail	FC2	—
Charadrius alexandrinus nivosus	Western Snowy Plover	FT	ST
Tringa melanoleuca	Greater Yellowlegs	BA	—
Numenius americanus	Long-billed Curlew	BT	—
Sterna caspia	Caspian tern	BT	—
Brachyramphus marmoratus marmoratus	Marbled Murrelet	FT	SC
Glaucidium gnoma	Northern Pygmy Owl	BT	SU
Athene cunicularia	Burrowing Owl	BS	SC
Strix occidentalis caurina	Northern Spotted Owl	FT	ST

Table 3-32. Special Status Animal Species Known or Suspected to Occur in the Coos Bay District (continued)

Scientific Name	Common Name	Status[1]	
		Federal	State
Selasphorus sasin	Allen's Hummingbird	BT	—
Melanerpes lewis	Lewis' Woodpecker	BS	SC
Melanerpes formicivorus	Acorn Woodpecker	BT	SU
Picoides arcticus	Black-backed Woodpecker	BS	SC
Dryocopus pileatus	Pileated Woodpecker	BS	SC
Sayornis nigricans	Black Phoebe	BT	—
Progne subis	Purple Martin	BS	SC
Sialia mexicana	Western Bluebird	BT	SV
Lanius ludovicianus	Loggerhead Shrike	FC	SU
Mammals			
Plecotus townsendii	Townsend's Big-Eared Bat	FC2	SC
Myotis thysanodes	Fringed Myotis	BS	SV
Arborimus albipes	White-Footed Vole	FC2	SU
Martes pennanti pacifica	Pacific Fisher	FC2	SC
Thomomys mazama helleri	Gold Beach Western Pocket Gopher	FC2	—
Thomomys bottae detumidus	Pistol River Pocket Gopher	FC2	—
Bassariscus astutus	Ringtail	BT	SU
Martes americana	Marten	BS	SC
Balaenoptera musculus	Blue Whale	FE	SE
Balaenoptera physalus	Finback Whale	FE	SE
Balaena glacialis	Right Whale	FE	SE
Balaenoptera borealis	Sei Whale	FE	SE
Physeter catodon	Sperm Whale	FE	SE
Enhydra lutris nereis	Southern Sea Otter	FT	ST
Escrichtius robustus	Grey Whale	FE	SE
Eumetopias jubatus	Northern (Stellar) Sea Lion	FT	SC

Table 3-32. Special Status Animal Species Known or Suspected to Occur in the Coos Bay District (continued)

Scientific Name	Common Name	Status[1] Federal	Status[1] State
Megaptera novaeangliae	Humpback Whale	FE	SE
Amphibians			
Rhyacotriton variegatus	Southern Torrent (formerly Olympic) Salamander	BT	SV
Aneides ferreus	Clouded Salamander	BT	SU
Batrachoseps attenuatus	California Slender Salamander	BA	SP
Plethodon elongatus	Del Norte Salamander	FC2	SV
Plethodon stormi	Siskiyou Mountains Salamander	FC2	SV
Bufo boreas	Western Toad	BT	SV
Ascaphus truei	Tailed Frog	BT	SV
Rana aurora aurora	Northern Red-Legged Frog	FC2	SU
Rana boylei	Foothill Yellow-legged Frog	FC2	SV
Rana pretiosa	Spotted Frog	FC	SC
Reptiles			
Chrysemys picta	Painted Turtle	BS	SC
Clemmys marmorata marmorata	Western Pond Turtle	FC2	SC
Caretta caretta	Loggerhead Sea Turtle	FE	ST
Chelonia mydas	Green Sea Turtle	FE	SE
Dermochelys coriacea	Leatherback Sea Turtle	FE	SE
Lepidochelys olivacea	Pacific Ridley Sea Turtle	FT	ST
Contia tenuis	Sharptail Snake	BT	SV
Lampropeltis zonata	California Mountain Kingsnake	BT	SP
Lampropeltis getulus	Common Kingsnake	BT	SP

Table 3-32. Special Status Animal Species Known or Suspected to Occur in the Coos Bay District (continued)

[1] **Abbreviations used in this table:**

Federal Categories:
FT = Federal Threatened
FE = Federal Endangered
FC = Federal Candidate

Federal Candidate Categories:
1 Taxa with enough information to support proposals to list as endangered or threatened.
2 Taxa with some evidence of vulnerability, but for which there are not enough data to support listing proposals at this time.
3CTaxa which have proven to be more abundant or widespread than previously believed and/or which have no identifiable threats. This status is based only on the most recently published Candidate Notice of Review.

BLM Categories:
BS = Bureau Sensitive species
BA = Bureau Assessment species
BT = Bureau Tracking species

Bureau Sensitive Species - In Oregon, these are taxa which are eligible for federal listed, federal candidate, or state listed status. These taxa are from the Oregon Sensitive Species-Critical list and/or Oregon Natural Heritage Program (ONHP) List 1.

Bureau Assessment Species - Species not included as FT, FE, FP, FC, State Listed or BS which are on the ONHP List 2.

Bureau Tracking Species - Taxa not included as FT, FE, FP, FC, State Listed, BS or BA which are State Sensitive (Vulnerable, Peripheral or Naturally Rare, or Status Undetermined) or on the Oregon Natural Heritage Program (ONHP) List 3 or 4.

The ONHP maintains five lists of special status species:

List 1 contains taxa that are threatened with extinction or presumed to be extinct throughout their entire range.

List 2 contains taxa that are threatened with extirpation or presumed to be extirpated from the state of Oregon. These are often peripheral or disjunct species which are of concern when considering the floral and faunal diversity within Oregon's borders.

List 3 contains species for which more information is needed before status can be determined, but which may be threatened or endangered in Oregon or throughout their range.

List 4 contains taxa which are of concern, but are not currently threatened or endangered. This includes taxa which are very rare but are currently secure, as well as taxa which are declining in numbers or habitat but are still too common to be proposed as threatened or endangered.

The fifth category, Taxa Considered but Rejected, contains all taxa deleted from any of the above lists or nominated to these lists but rejected. (ONHP 1993)

State Categories:
ST = State Threatened
SE = State Endangered
SC = State Critical
SV = State Vulnerable
SU = State Undetermined Status
SP = State Peripheral or Naturally Rare

State Critical (SC) - Species for which listing as threatened or endangered is pending; or those for which listing as threatened or endangered may be appropriate if immediate conservation actions are not taken. Also considered critical are some peripheral species which are at risk throughout their range, and some disjunct populations.

State Vulnerable (SV) - Species for which listing as threatened or endangered is not believed to be imminent and can be avoided through continued or expanded use of adequate protective measures and monitoring. In some cases the population is sustainable, and protective measures are being implemented; in others, the populations may be declining and improved protective measures are needed to maintain sustainable populations over time.

State Undetermined Status (SU) - Animals in this category are species for which status is unclear. They may be susceptible to population decline of sufficient magnitude that they could qualify for endangered, threatened, critical or vulnerable status, but scientific study will be required before a judgement can be made.

State Peripheral or Naturally Rare (SP) - Peripheral species refer to Oregon populations on the edge of their range. Naturally rare species had low population numbers historically in Oregon because of naturally limiting factors. Maintaining the status quo for the habitats and populations of these species is a minimum requirement. Disjunct populations of several species which occur in Oregon should not be confused with peripheral.

Oregon Natural Heritage Program, August 1993

Numerous research and monitoring studies specific to the habitat needs of the spotted owl have been conducted by several researchers.

Research and monitoring of spotted owls in California, Oregon, and Washington indicate that the spotted owl is primarily associated with old-growth and mature forest types (Barrows 1981; Barrows and Barrows 1978; Carey 1985; Forsman 1976, 1980, 1986; Forsman and Meslow 1985, 1986; Forsman et al. 1977, 1984, 1987; Garcia 1979; Gould 1977; Gutierrez 1985; Gutierrez et al. 1984; Marcot and Gardetto 1980; Meslow et al. 1986; Postovit 1977; Solis and Gutierrez 1982).

Spotted owls commonly nest in cavities 50 feet or more above the ground in large, decadent old-growth trees (Forsman et al. 1984, Gutierrez 1985). Other nest sites include large mistletoe clumps and platforms formed by whorls of large branches. Platform nests appear to be used more commonly in southwest Oregon than further north.

Research indicates that spotted owls prefer old growth, seldom foraging in clearcuts or second-growth stands younger than 60 years of age (Forsman et al. 1984 and 1987, Solis 1983). Abundance of prey and habitat with structural features favorable for foraging are important factors in preference for old growth (Carey et al. 1986a and 1986b, Forsman et al. 1984, Raphael and Barrett 1984, and Raphael et al. 1986). Spotted owl habitat must be capable of supporting one or more of the following: bushy-tailed woodrat, red tree vole, flying squirrel, snowshoe hare, deer mouse, and western red-backed vole all of which are found in the owl's diet.

The spotted owl's preference for mature and old-growth forest for roosting (Forsman 1980, Marcot and Gardetto 1980) may be a response to the owl's needs for thermoregulation (Barrows 1981). Avoiding great horned owls, a major predator of spotted owls, may also be an important factor.

Spotted owl selection of old-growth habitat components in younger forests indicate that habitat structure, rather than age, may be an essential factor (Forsman 1976 and 1986, Forsman et al. 1977 and 1984, Garcia 1979, Meslow et al. 1986, and Postovit 1977). Even with these old-growth components, spotted owl densities in young growth are lower than in old growth (Forsman 1976 and 1986, Forsman et al. 1977 and 1984, Garcia 1979, Meslow et al. 1986, Postovit 1977, and Vincent 1986).

Published home range sizes of individual spotted owls vary from 600 acres to more than 19,000 acres (Allen and Brewer 1985, Allen et al. 1987, Brewer 1985, Forsman 1986 and 1987, Forsman et al. 1984, Forsman and Meslow 1985, Meslow et al. 1986, Reid et al. 1987, Sisco and Gutierrez 1984, and Solis 1983). Little is known about the factors that influence home range selection and size, although habitat quality fragmentation and structure probably play a major role (Carey 1985, Dawson et al. 1986, Forsman et al. 1984, Forsman and Meslow 1986, and Gutierrez 1985). It also appears that spotted owls in southern Oregon and northern California have smaller home ranges than owls in Washington and northern Oregon.

Habitat of the northern spotted owl varies somewhat between the district's three resource areas. At one end of the spectrum is the Myrtlewood Resource Area where much of the habitat is less than 200 years old, highly fragmented, and interspersed with private lands which have forests predominantly less than 60 years old. Tioga Resource Area, on the opposite end of the spectrum, contains larger amounts of forest greater than 200 years old, but relatively less fragmented because public ownership is more complete. The Umpqua Resource Area, which contains a mix of stand ages with a moderate amount of private inholdings, is between the two spectrums.

For habitat studies to be comprehensive, however, it is essential to know not only the type of habitat a species occupies, but how well the species is surviving in that habitat. Accordingly, in 1990, the Coos Bay BLM District contracted with the Pacific Southwest Forest and Range Experiment Station (PSW), a research branch of the Forest Service, to conduct a study on survival and reproductive rates by gathering data on the spotted owls in varying types of habitat. A key objective of this study is to determine if any, or all, of the different habitat types in the planning area's three resource areas actually meet the needs of the northern spotted owl. Data on the number of occupied sites in the district is listed in Table 3-33.

Although the study results are still preliminary, some observations can be made with four years of data. The sample size of the spotted owls identified in the district is continually growing. To date, more than 420 individual owls have been banded with colored plastic leg tags and metal bird bands.

Reproduction has varied significantly from year-to-year. In 1990, the first year of the study, 72 percent of the pairs checked for reproduction nested. The

Table 3-33. Number of Occupied Spotted Owl Sites on the Coos Bay District by Resource Area

Site Status	Myrtlewood [1]	Tioga [2, 3]	Umpqua [4]	Total
Pair status known:				
Pairs	13	36	22	71
Single males	2	3	2	7
Single females	0	1	2	3
Pair status unknown:				
Male and female response:				
Male & female confirmed	4	4	2	10
Male only confirmed	4	1	0	5
Female only confirmed	0	0	1	1
Male confirmed:				
Incomplete survey	1	1	3	5
Female confirmed:				
Incomplete survey	0	0	1	1
Total Occupied sites	24	46	33	103
Sites with owl "Present" [5]	3	4	5	12

[1] Most habitat less than 200 years old, highly fragmented, and interspersed with private lands that have predominately forests less than 60 years old.

[2] Larger amounts of forest greater than 200 years old; relatively less fragmented; public ownership more complete.

[3] Tioga totals include eight sites on Weyerhaeuser lands.

[4] Forest contains mix of stand ages; moderate amount of private inholdings.

[5] Sites with owl "present" are those where there was only a single response from a male, female, both a male and a female, or an unknown sex bird.

Source: Pacific Southwest Forest and Range Experiment Station, 1993.

next year only 18 percent of the pairs nested. In 1992, the percentage of pairs nesting increased to 75 percent. In 1993, 19 percent of the pairs nested. Based on this study and others within the Pacific Northwest, it appears that dramatic fluctuations of reproduction occur rather commonly and over the short term may have little effect on changes in population size.

Movement of owls has been tracked from year-to-year to help understand dispersal patterns and track individual birds. Adults and subadults moved an average of 5.4 miles, while juveniles moved an average of 16.3 miles from their natal area. The longest documented movement was of a bird identified near Loon Lake in Douglas County that was relocated near Lobster Creek in Curry County the next year, about 70 miles to the south.

During the last four years, 77 spotted owl nest trees have been located. Douglas-fir with a mean dbh of 62 inches accounted for 74 percent of the nest trees, but nests were also found in cedar, big leaf maple and western hemlock. One nest was found in a cliff during 1992. This may be the first documented cliff nest for the northern spotted owl out of more than 2,000 known nests.

After analyzing more than 667 egested northern spotted owl pellets from the Coos Bay District, biologists have determined that the primary prey species of the northern spotted owls in the study area is the northern flying squirrel. Red tree voles, and dusky-footed and bushy-tailed woodrats are secondary prey species.

A significant increase in the detection of barred owls, a species closely related to the spotted owl, is causing concern about potential competition. The barred owl is more aggressive than the spotted owl and appears able to adapt better to a fragmented landscape. In 1990, barred owls were detected at one site. In 1993, they were detected at 11 different sites.

As discussed, there is a significant annual variation in reproduction from year-to-year, which is probably not unusual for a long-lived species such as the spotted owl. Reproduction activity over the short term may have little effect on changes in population size.

The best indication of population health (increasing or decreasing population size) can be calculated by analyzing female adult survival rates, fecundity (the number of female young fledged per female) and juvenile and subadult survival. Analysis of four years of study data shows the Coos Bay District's spotted owl population is significantly declining at a rate of 7.3 percent per year (Zabel and Brown 1994).

Burnham et al. (1994) combined data from 11 spotted owl populations in California, Washington, and Oregon (including the Coos Bay data) and found that together this larger population was declining at about 4.5 percent per year. They further concluded that the rate of population loss is accelerating.

Bald Eagle (*Haliaeetus leucocephalus*)

Inventory for another federal threatened species, the bald eagle, indicates seven nesting pairs on, or immediately adjacent to, BLM-administered lands in the district. Inventories of wintering bald eagles generally find between 10 and 12 birds using the district, mostly along the Umpqua River.

In the Pacific Northwest, bald eagles nest primarily in ponderosa pine, mixed-conifer, Douglas-fir, and Sitka spruce/western hemlock forests (Anthony et al. 1980). Some nesting has occurred along large river systems where black cottonwood was the selected tree species. Anthony and Isaacs (1988) indicated that most nests (84 percent) were located within one mile of large bodies of water such as lakes, reservoirs, large rivers and coast estuaries. Nest trees were found to be the larger, dominant or codominant trees in the stand and were usually components of old-growth or old-aged second growth forests (Anthony and Isaacs 1988). According to the findings of these researchers, trees used by bald eagles for nesting were larger and older than those produced under 80- to 100-year timber rotation systems. The nest trees selected usually have an open view of the area, a clear flight path to and from the tree, and suitable perch trees nearby.

Anthony et al. (1982) described communal night roost characteristics in the mixed-conifer and Douglas-fir types. In both cases, the actual roost trees were larger than those in the surrounding forest. In specific studies, Stalmaster (1981) and Keister (1981) showed the existence of more favorable micro-climates in communal roost areas than in adjacent forest stands, thereby aiding in energy conservation by the birds.

Bald eagles feed primarily on fish during the spring and summer, but may shift to waterfowl and carrion during the winter.

The Pacific Bald Eagle Recovery Plan prepared by the USFWS (1986) is currently being implemented by the cooperating agencies including BLM.

Snowy Plover (*Charadrius alexandrinus nivosus*)

The snowy plover, a federal threatened species, historically bred along Oregon's coastline. However, plover populations are now threatened by human disturbance at their nests; loss of nesting habitat primarily due to encroachment of European beachgrass; and predation by crows, ravens, skunks, red foxes, dogs, and other animals. Based on 1993 breeding surveys, at least 15 areas of historic snowy plover use on the district have no evidence of breeding activity. Seven areas, including Coos Bay's North Spit and the New River area, supported the entire Oregon coastal breeding population. Surveys of wintering birds indicate that three areas on the Oregon coast support all known birds. In previous years, the area between New River and Bandon typically supported the largest coastal wintering population. No snowy plovers were found in this area in the 1993 winter survey. Surveys have also shown that while plovers use some beach areas during both seasons, other areas are more important during either breeding or wintering (ODFW 1987). There appears to be a fair amount of unexplained variability from year-to-year.

Coos Bay's North Spit was first recognized as an important snowy plover breeding area in 1972 when 18 percent of all snowy plovers (39 of 216) surveyed on the Oregon Coast were found there (Wilson-Jacobs and Dorsey 1985).

Use of North Spit dredge spoils by nesting snowy plovers was first documented in 1979 (Wilson 1980). From 1979 to 1982, 54 percent of all breeding snowy plovers on the North Spit were observed on dredge spoil sites (Wilson-Jacobs and Dorsey 1985).

Numbers of snowy plovers have significantly decreased both along the entire coast and at the North Spit. In 1993, only 11 birds were counted for the North Spit breeding season survey; this represented about 25 percent of the entire known coastal breeding populations of 45 birds (Table 3-34).

Although numbers of breeding snowy plovers on the North Spit have declined over the last few years, the number of hatchlings for the last three years has been far greater due to an intense effort to protect nests from predation. Beginning in 1992, selected snowy plover nests were fenced with wire mesh early in the nesting season to exclude mammalian and avian predators. During 1993, on the south coast, nests that were fenced from predators had an 83 percent success rate versus a 33 percent success rate for unprotected nests.

Table 3-34. Annual Snowy Plover Counts From Breeding and Wintering Surveys at Coos Bay's North Spit and in the New River Area Compared to the Total for all Oregon Coastal Sites

Area	1987		1988		1989		1990		1991		1992		1993	
	B	W	B	W	B	W	B	W	B	W	B	W	B	W
Coos Bay North Spit	20	10	18	0	24	2	22	19	11	0	7	0	11	0
Bandon to New River	9	4	10	23	8	20	9	14	9	19	2	17	12	0
New River to Floras Lake	3	2	2	0	1	1	8	0	5	0	5	0	12	0
Oregon Coast All Sites	64	46	53	50	59	81	59	50	35	38	30	54	45	36

Abbreviations used in this table:
B = Breeding Survey Count
W = Wintering Survey Count

The North Spit's ocean beach had been an important wintering area for snowy plovers. The bay side beaches receive very little use at any time of year (Wilson-Jacobs and Dorsey 1985). In 1990, about 38 percent of the entire known winter coastal population of plovers were found on the North Spit, but no plovers were counted during the last three winters.

The New River area is also an important snowy plover area that has been monitored annually by ODFW and BLM. During the past six years, as many as 12 birds have been counted during the breeding surveys along the coast adjacent to New River (see Table 3-34). In the coastal stretch from the mouth of New River to Bandon, 8 to 12 birds have been found during the breeding season and up to 23 (almost 50 percent of the total coastal population) have been counted during the winter season. The 1993 winter survey, however, found no birds.

In addition to predators, human activities are affecting snowy plovers on the North Spit. During past nesting seasons, OHV traffic and other human activities regularly disturbed unprotected nesting plovers (Craig et al. 1992) on the North Spit. OHV tracks were regularly seen in the zone where most of the nests were located. South of Bandon, nests were probably disturbed by human activity and the high winds which are common there. Further south at New River, one nest was nearly destroyed by horseback riders. Protective cages and fencing can mitigate some of the accidental human disturbances.

Habitat at New River and on the North Spit has been affected by European beachgrass as has most of the coastal sandy areas. Since its introduction into this country about 1900 to stabilize dunes, European beachgrass has spread along the entire coast and covered many former nesting areas. The amount of open beaches has decreased and beaches have become steep, making it harder for plovers to find good nesting sites. The large clumps of beachgrass also provide good habitat for some of the predators that prey on the plover.

Two areas where snowy plover nesting habitat remain are where the European beachgrass has been reduced: on the North Spit where dredged materials from the bay have been dumped, and at New River where Floras Creek and the ocean meet and periodically wash away most grass.

The Snowy Plover Working Group, an interagency and public interest task force, has formed to help conserve the species and its habitat. Efforts of the group have concentrated on research on snowy plover ecology, techniques to reduce European beachgrass in key areas, and public education and management to reduce disturbance of nesting plovers.

Marbled Murrelet (*Brachyramphus marmoratus marmoratus*)

The marbled murrelet, a robin-sized seabird which nests in the forests of the Pacific Northwest, is a federally threatened species in California, Oregon and Washington.

The marbled murrelet occurs along the West Coast from central California north to the Aleutian Islands. Individuals in the Pacific Northwest have been detected inland more than 35 miles from the ocean.

In Oregon, the marbled murrelet occurs along the entire coast but is most common between Coos Bay and Yaquina Bay and the adjoining inland areas (Marshall 1992).

Habitat for the species includes the open ocean, near shore, estuaries, sounds and other inland saltwater. Marbled murrelets use inland freshwater lakes in some areas.

From British Columbia to California, the marbled murrelet nests in old-growth forests or mature forests with old-growth characteristics including broken tops and deformed branches. Nests are found on large, moss- or debris-covered, sheltered branches that provide protection against rain, wind and detection by predators. The murrelet nests in aggregations and uses forests year round. The reasons for winter use are unknown. The size of nesting aggregations is related to stand size, the larger stands having more birds (Marshall 1992). There are 15 known nests sites in Oregon, with a few more found each year (Nelson, Pers. Comm.).

Surveys for the marbled murrelet have been conducted in the Coos Bay District for the past five years. Many of the surveys have been to detect murrelet use of proposed timber sale areas. In addition, surveys have been conducted in other areas of potential habitat, and an OSU research project has been underway for the past three years in the Cherry Creek natural area and several other selected sites in the district.

Table 3-35 lists marbled murrelet occupied sites and sites where just presence of murrelets were detected.

To date, there are 39 occupied sites in the district and 62 sites where presence has been detected. No nest sites have been confirmed in the Coos Bay District.

An occupied site is an area where murrelet activity indicative of nesting has been observed. For example, a particular forest stand where a murrelet is seen circling or entering would be considered an occupied site. A detection is merely an observation of a bird, where the bird's behavior does not indicate a focus on a particular area.

To quantify the amount of potential marbled murrelet habitat within the district, habitat was estimated using forest stand descriptions in Micro*Storms for stand age and stocking levels. Generally, potential murrelet habitat was described as stands older than 150 years of age, or stands with an overstory of at least 120 years of age with a well-stocked understory at least 80 years old. These stands would most likely have trees with the characteristics described above for known nesting sites in the Pacific Northwest.

Because habitat closer to the ocean has been described as more important for the murrelet, this habitat was analyzed by distribution in four zones described in miles from the ocean: 0-12, 13-25, 26-35 and 36-50.

Analysis indicates that the Coos Bay District currently has a total of approximately 103,000 acres of marbled murrelet habitat which is about 33 percent of the total forest acres in the district. Most (99 percent) of the district's habitat and ownership is within 35 miles of the coast and consequently lies entirely within the range of the species.

Table 3-36 lists the acres of marbled murrelet habitat by zone along with total BLM acres for Coos Bay compared with acres of murrelet habitat by all BLM districts.

The Coos Bay District has about 10,000 acres of marbled murrelet habitat in the 0-12 mile zone, which are potentially the most important for murrelets considering their proximity to the coast. The district manages about 80 percent of the marbled murrelet habitat on public land in this zone within western Oregon.

Aleutian Canada Goose (*Branta canadensis leucopareia*)

The Aleutian Canada goose, a subspecies of the Canada goose, is a federally threatened species. The Aleutian goose nests on islands in the Aleutian chain in Alaska, and then migrates through Oregon to wintering areas in central California. The New River area provides an important resting area for this species during its spring migration.

Introduction of Arctic fox into the nesting areas of these geese in the 1800s caused the entire population of Aleutian Canada geese to decline to less than 1,000. Because of this population decline, the U.S. Fish and Wildlife Service listed the species as endangered in 1967.

Recovery activities followed the listing, and in 1990 the species was downgraded to threatened status as a result of the success of the recovery efforts. The population of the Aleutian Canada goose currently is more than 5,000.

Table 3 -35. Marbled Murrelet Occupied Sites on the Coos Bay District

	Resource Area			District
Site	Myrtlewood	Tioga	Umpqua	Total
Occupied	6	12	21	39
Presence	13	32	17	62

Data as of April 1994.

Table 3-36. Marbled Murrelet Habitat Within the Coos Bay District Compared with District Total Forest Acres and BLM Marbled Murrelet Habitat in Western Oregon

Miles from Coast	Coos Bay Dist. Forest Acres	Marbled Murrelet Habitat Acres	West. Ore. BLM Habitat Acres
0-12	37,015	9,526	12,038
13-25	138,523	46,974	73,938
26-35	129,650	44,718	115,386
36-50	3,831	1,167	156,479
Total	**309,019**	**102,385**	**357,841**

Based on inventories conducted from 1989 to 1993, the New River area wetlands are an important staging area for the Aleutian Canada Goose. Each year in late February or early March, a small group of Aleutian Canada Goose move up the coast from California. Typically, these birds rest and feed on the off-shore sea rocks near Bandon and occasionally move to the New River area to feed. Usually during the first or second week in April, the main population leaves the main staging area at Lake Earl near Crescent City and moves up the coast. Depending probably on the weather, the birds may stay and feed in the New River area for a week or so, or they might move through with only a short stay. For the past three years, between 1,200 and 1,800 geese have stopped from a day to about a week in the New River area on private and public lands.

During this migration, these geese seem to prefer shorter grass habitats, both down in the New River area and on the rocks off Bandon.

Western Pond Turtle (*Clemmys marmorata*)

The Western pond turtle is a federal candidate species and Oregon sensitive species which occurs in western Oregon west of the Cascades generally below 2,500 feet. The species typically occurs in marshes, sloughs, ponds and slow-moving sections of rivers and streams (Marshall 1992).

A number of factors are thought to have led to the decline in population of the Western pond turtle including habitat alteration, introduced predators (bullfrogs and bass), illegal collecting, and potentially disease (Marshall 1992).

District inventories have found pond turtles in a few habitats in Coos and Curry counties. Individuals have been reported from Middle, Sandy and Rock creeks; as well as New River and Loon Lake, all of which are on or near public lands.

White-Footed Vole (*Arborimus albipes*)

The white-footed vole is a federal candidate species and an Oregon sensitive species. It is extremely uncommon within its range and only 28 cataloged museum specimens had been located as of 1967. Recent, intensive, small-mammal trapping studies in the Oregon Coast range have also turned up relatively few of this species (Marshall 1992).

Based on the limited information available, the species appears to be associated with riparian alder/small stream habitats, often in heavy cover consisting of downed logs and/or brush (Marshall 1992). There is one record of this species in the district.

Townsend's Big-Eared Bat (*Plecotus townsendii*)

The Townsend's big-eared bat is a federal candidate species and an Oregon sensitive species. The species is declining severely in Oregon and other states primarily due to human disturbance and habitat destruction.

Caves and cave-like structures are important habitat for the big-eared bat, both as winter hibernating sites and as roosts for summer nursery colonies (Perkins 1987). The species will also use abandoned mine tunnels and buildings. Other important habitat features include wet meadows, caves, estuaries, and riparian areas.

Inventories on the big-eared bat within the district are limited to those reported by Perkins (1987). There have been two recorded known locations of the bat on BLM-administered land in the district. Cross (1976) in surveys of Curry, Josephine and Jackson counties reported three nursery colonies in southwest Oregon, none of which were on BLM-administered land.

Del Norte salamander (*Plethodon elongatus*)

The Del Norte salamander is a federal candidate species and an Oregon sensitive species. It is a medium-sized, very slender salamander which occurs in extreme southwest Oregon in Curry County and on the southern edge of Coos County. It occurs in rock talus in conifer forests and on forest floors under decaying downed snags and other litter from sea level to about 4,000 feet.

The species reportedly has a low tolerance for environmental disturbances, such as timber harvesting, that change temperature and moisture conditions (Marshall 1992).

Red-Legged Frog (*Rana aurora*)

The red-legged frog is a federal candidate species and an Oregon sensitive species. It is a medium-sized amphibian which ranges west of the Cascades in Oregon. Its habitat includes marshes, ponds, and streams with little or no flow from valley floors to about 2,700 feet elevation. It can occur in seasonal waters, if wet, until late May or early June. It is often found in dense stands of hardwoods with heavy ground cover (Marshall 1992). The red-legged frog has been documented on public lands within the Coos Bay District with populations occurring in the New River ACEC and on the North Spit of Coos Bay.

Foothill Yellow-legged Frog (*Rana boylei*)

The Foothill Yellow-legged Frog is a federal candidate species and an Oregon sensitive species. It is a small to medium-sized amphibian with a toad-like appearance. It ranges throughout western Oregon with specimens reported from Douglas, Coos, and Curry counties. Its habitat is permanent streams and vicinity, mainly in rocky, gravelly and sandy areas. The species has been recorded on public lands within the district. At one time this species was considered common within its range, but its current status is unknown (Marshall 1992).

Northern Goshawk (*Accipiter gentilis*)

The Northern Goshawk is a federal candidate species and an Oregon sensitive species. It is the largest of the three North American accipiters. It breeds throughout the sub-arctic and temperate forests of North America. In Oregon it breeds in the Klamath Mountains, Cascades, and ranges east of the Cascades. It is not known to nest in the Oregon Coast Range. Although likely to occur on district lands in Curry County, the goshawk has not yet been documented nesting there.

It is found in a variety of mature forest types including both deciduous and evergreen types. All but one of the 74 nests studied by Reynolds et al. in Oregon were in dense, mature or old-growth stands.

Three major threats to accipiters have been identified: loss of breeding and wintering habitat primarily due to timber harvest practices, reduced nesting success and reproductive failure from pesticides, and human disturbance (Marshall 1992).

Pacific Fisher (*Martes pennanti pacifica*)

The fisher is a federal candidate species and an Oregon sensitive species. It is a long-bodied, short-legged, medium-sized carnivore. In western Oregon the fisher occurs in the Coast Range, Klamath Mountains, and Cascade Range. No habitat studies have been completed in Oregon but studies conducted primarily in the eastern U. S. show a preference for forests dominated by conifers with some hardwoods present. Dense, mature and old-growth forest stands are believed to constitute optimum habitat (Marshall 1992).

Fishers sleep under logs or brush, in ground or snow burrows, and in tree nests. In northwest California, they mainly use large living trees (average dbh 46 inches) snags, and fallen logs. Principal foods are porcupines, snowshoe hares, squirrels, small mammals, and carrion (Marshall 1992).

Fishers occur in low densities and require large habitat blocks. There have been several fishers documented on public lands within the district.

Gold Beach Pocket Gopher (*Thomomys mazama helleri*)

Pistol River Pocket Gopher (*Thomomys bottae detumidus*)

These pocket gophers are federal candidate species. They are vegetarian rodents that spend most of their lives underground. Their habitat includes prairies, open forests, grasslands, and mountain meadows.

Both subspecies have a very limited distribution. The Gold Beach pocket gopher is known only to occur at the mouth of the Rogue River in Curry County (Maser 1981). The Pistol River pocket gopher is known only from the Pistol River, also in Curry County. To date, neither gopher has been documented on public lands within the planning area.

Mountain Quail (*Oreortyx picta*)

Mountain quail are federal candidate species that occur throughout western Oregon in the early seral stages of succession of coniferous forests. Within the district, mountain quail are found in areas from about 3 to 15 years following wildfire or clearcutting. Although no studies have been conducted to document relative abundance, it is thought to be fairly common in its preferred habitat within the Coos Bay District.

SEIS Special Attention Species (Animals)

The following information has been paraphrased from the SEIS ROD, and where appropriate includes additional information pertinent to the Coos Bay District.

Invertebrates

Invertebrates, which include tens of thousands of species, comprise an important part of virtually every ecosystem. Many species are endemic to small areas of the Pacific Northwest. The diversity, habitat specificity, and low mobility of invertebrates make them subject to impacts from land management activities. Many species have not been described, or are poorly understood. In addition, their functions in these ecosystems—including their role in nutrient cycling, in the food chain, and as pollination agents—is not well studied on either the local or regional scale. The Coos Bay District has not conducted local or range-wide surveys to assess the diversity or distribution of invertebrate species included in Appendix G.

Mollusks

Approximately 350 species of mollusks (including land snails, aquatic snails, slugs, and clams) are found in the Pacific Northwest. Although no intensive or extensive surveys have been conducted, none of the species listed in Appendix G are known or suspected to occur in the district. Most mollusk species are limited to moist environments, and many are associated with late-successional forests. Due to their low mobility and susceptibility to habitat modification, these species often poorly recolonize in adversely-impacted habitats.

Amphibians and Reptiles

Many amphibian species rely on aquatic or moist habitats. Several species are associated with components of late-successional forests, including moist microclimate, clean water, large down logs, and forest litter. Of the species included in Appendix G, the Del Norte salamander is known to exist within the Myrtlewood resource area, and the Siskiyou Mountains salamander may occur in areas of the Klamath Province within the district.

Birds

Of the four bird species described in the SEIS ROD which need protection buffers in the Matrix, only the black-backed woodpecker may possibly occur within the Coos Bay District. It is unlikely that the other three species (white-headed woodpecker, pygmy nuthatch and flammulated owl) occur on public lands within the district.

Mammals

The SEIS specifies additional protection for habitat of bats occurring in the district. All 11 species of bats known or suspected to occur within the Coos Bay District (including fringed myotis, silver haired bats, long-eared myotis, and long-legged myotis) are specifically mentioned in the SEIS. The most current information indicates that the pallid bat (also mentioned in the SEIS) is not likely to occur within the district.

The red tree vole (category 2 survey and manage species) is another mammal specifically mentioned in the SEIS. Although this vole is believed to occur throughout the district in older forests, its specific distribution and relative abundance are poorly known.

Special Areas

Special areas are currently identified for management on BLM-administered lands through designations, such as Areas of Critical Environmental Concern (ACEC) or Research Natural Areas (RNAs) and other land use plan allocations with specific designations, such as Environmental Education Areas. The district manages three special areas including one ACEC totaling approximately 883 acres, one Research Natural Area totaling approximately 570 acres, and one Environmental Education Area totaling approximately 70 acres. A review determined that all existing special areas met the relevance and importance criteria (see Glossary).

Existing special areas are described in Table 3-37 and displayed on Map 3-6.

During the RMP analysis process, nine candidate ACECs were identified and screened for eligibility for further consideration in this RMP (see Appendix III-K of the draft RMP for a designation of the screening process and results; screening reports are available for review in district special area files). As a result of this process, nine potential areas are being considered for possible ACEC designation and management through this RMP. These areas are described in Table 3-38 and displayed on Map 3-6. The decision to designate any or all of the potential ACECs will be part of the district's RMP decision, which will be made following completion of the RMP/EIS. The present condition of each existing and potential special area was described in Appendix III-J of the draft RMP.

Table 3-37. Existing Special Areas

Site Name	Approximate Size (acres)	Primary Resource Value/Description
New River ACEC (Coos and Curry Counties)	883 [1]	Special Status Species - River area and uplands contain important habitat for the American and Arctic peregrine falcon, bald eagle, Aleutian Canada goose, and western snowy plover—all federally listed species. Botanical species habitat supported in the New River area include silvery phacelia, western bog lily, pink sandverbena— all federal proposed or candidate species. Plant Communities - Includes natural meadows, wetlands, sand dunes, and other habitat types supporting many unique plant species. Fish Habitat - High quality estuary and freshwater wetland. Important rearing habitat for a unique run of native chinook salmon and steelhead. Coho salmon are also in the system. Wildlife Habitat - Upland areas provide supporting habitat types and act as a buffer which supports the integrity of the river habitat areas. Historic/Cultural - Numerous extensive prehistoric camps and villages border the river.
Cherry Creek RNA (Coos County)	570	Special Status Species - Contains important habitat for the northern spotted owl and the marbled murrelet, both federal threatened species. Natural System/Botanical - Fills three cells in the Oregon Natural Heritage Plan. Extensive stand of 300 to 500- year-old Douglas-fir, western hemlock, and western redcedar forest.
Powers Environmental Education Area (Coos County)	70	Used by Powers School District as an outdoor classroom for forestry-related activities.

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[1] The BLM is currently negotiating with several owners to acquire land which would be included in the ACEC.

Source: WODBB and district special area files.

Table 3-38. Potential Special Areas

Site Name	Approximate Size (acres)	Primary Resource Value/Description
Wassen Creek ACEC/RNA (Douglas County)	3,440	Special Status Species - Provides habitat for the northern spotted owl and marbled murrelet. Natural System/Botanical - Relatively undisturbed large block of mid-aged (100+ years) Douglas-fir forest that has the potential to fill five cells of the Oregon Natural Heritage Plan. Wassen Creek is a relatively pristine fourth order stream being considered for wild and scenic river designation.
North Fork Coquille River ACEC (Coos County)	290	Special Status Species - Provides habitat for the northern spotted owl. Natural System/Botanical - Relatively undisturbed old-growth Douglas-fir/hardwood riparian zone along fourth order stream. One of the highest waterfalls on the district is located here. Fish/Wildlife Habitat - The high quality conifer-dominated riparian zone provides important habitat for a wide variety of terrestrial wildlife species. Historically one of the best spawning habitat within the Coquille River System for native run of coho salmon, with up to 500 fish per linear mile.
China Wall ACEC (Coos County)	240	Special Status Species - Provides old-growth habitat for the northern spotted owl. *Phacelia verna* and a wide array of other flowering plants, grow in the dry meadows. Natural System/Botanical - Several small dry meadows are located along the top of a unique geologic feature called the "China Wall." This ridge of hard sedimentary rock, created by upthrusting, contains a strata of middle eocene oyster fossils. Historic/Cultural - Contains visible remnants of the historic Brewster Trail and a prehistoric site deemed eligible for nomination to the National Register of Historic Places.
Tioga Creek ACEC (Coos County)	40	Special Status Species - Provides old-growth habitat for the northern spotted owl. Natural System/Botanical - Tioga Creek is the best example of a mature conifer-dominated riparian zone with ample woody debris in the district.

Table 3-38. Potential Special Areas (continued)

Site Name	Approximate Size (acres)	Primary Resource Value/Description
		Fish/Wildlife Habitat - Contains significant populations of spawning coho salmon and steelhead. Used extensively by elk during periods of summer heat and winter cold.
North Spit ACEC (Coos County)	580	Special Status Species - Provides habitat for American peregrine falcons, bald eagles, the western snowy plover, brown pelican, and salt-marsh birds-beak—all federal threatened, endangered or candidate threatened species.
		Fish/Wildlife Species - Contains a diversity of habitats, from salt marsh to freshwater deflation plain marshes and open sand dunes. Critical habitat for a diversity of plant and animal species.
		Historic/Cultural - Used extensively by native Americans. Also the site of historic Camp Castaway and U.S. Lifesaving and Naval Facilities.
Upper Rock Creek ACEC/RNA (Coos County)	460	Special Status Species - Provides old-growth habitat for the northern spotted owl.
		Natural System/Botanical - One of the largest remaining redcedar-dominated forests in the Coast Range. Meets criteria for Oregon Natural Heritage Plan cell for western redcedar-western hemlock swamp.
North Fork Hunter Creek ACEC/RNA (Curry County)	1,730	Special Status Species - Two special status plant species have been identified growing on the rocky prairies, and several other species of concern occur in similar habitats.
		Natural System/Botanical - Extensive groves of Jeffrey Pine are interspersed with rocky prairies, serpentine outcrops, and boggy seeps. This is the only undisturbed example of a Jeffrey pine-white oak forest within 10 miles of the ocean in Oregon, and could fill an Oregon Natural Heritage Plan cell.
		Fish/Wildlife Habitat - High quality hardwood riparian zone borders the North Fork Hunter Creek, productive for both chinook salmon and steelhead. Large prairies and oak groves are heavily used by big game and terrestrial mammals.
		Historic/Cultural - A major prehistoric quarry/lithic manufacturing site is located on or adjacent to the proposed ACEC. Two cabin sites and visible portions of several historic trails are also present.

Table 3-38. Potential Special Areas (continued)

Site Name	Approximate Size (acres)	Primary Resource Value/Description
Hunter Creek Bog ACEC/RNA (Curry County)	570	Special Status Species - One federal candidate threatened species (Waldo's Gentian) and several special status plant species are present.
		Natural System/Botanical - As the largest, most diverse serpentine bog occurring in the coastal zone of the Siskiyou Mountains, it could fill two cells of the Oregon Natural Heritage Plan. Also contains extensive stands of Port-Orford-cedar that have not been affected by root rot.
		Historic/Cultural - One prehistoric lithic manufacturing site has been identified.
North Fork Chetco ACEC/RNA (Curry County)	600	Special Status Species - Contains important habitat for the northern spotted owl and marbled murrelet.
		Natural System/Botanical - Excellent representation of a mature hardwood forest along a major fourth order coastal river. Could fill two cells of the Oregon Natural Heritage Plan. Presently under consideration for Wild and Scenic River designation.
		Fish/Wildlife Habitat - The North Fork Chetco is important spawning/rearing habitat for runs of native chinook salmon and sea-run cutthroat.
		Historic/Cultural - Several major prehistoric sites are located adjacent to the riparian zone along the North Fork Chetco River.

Source: WODDB and district special area files.

Cultural Resources

The Coos Bay Planning Area contains lands within the southern subarea of the Northwest Coast Cultural Area. The area was also considerably influenced by the Northwest Californian Cultural Area to the south.

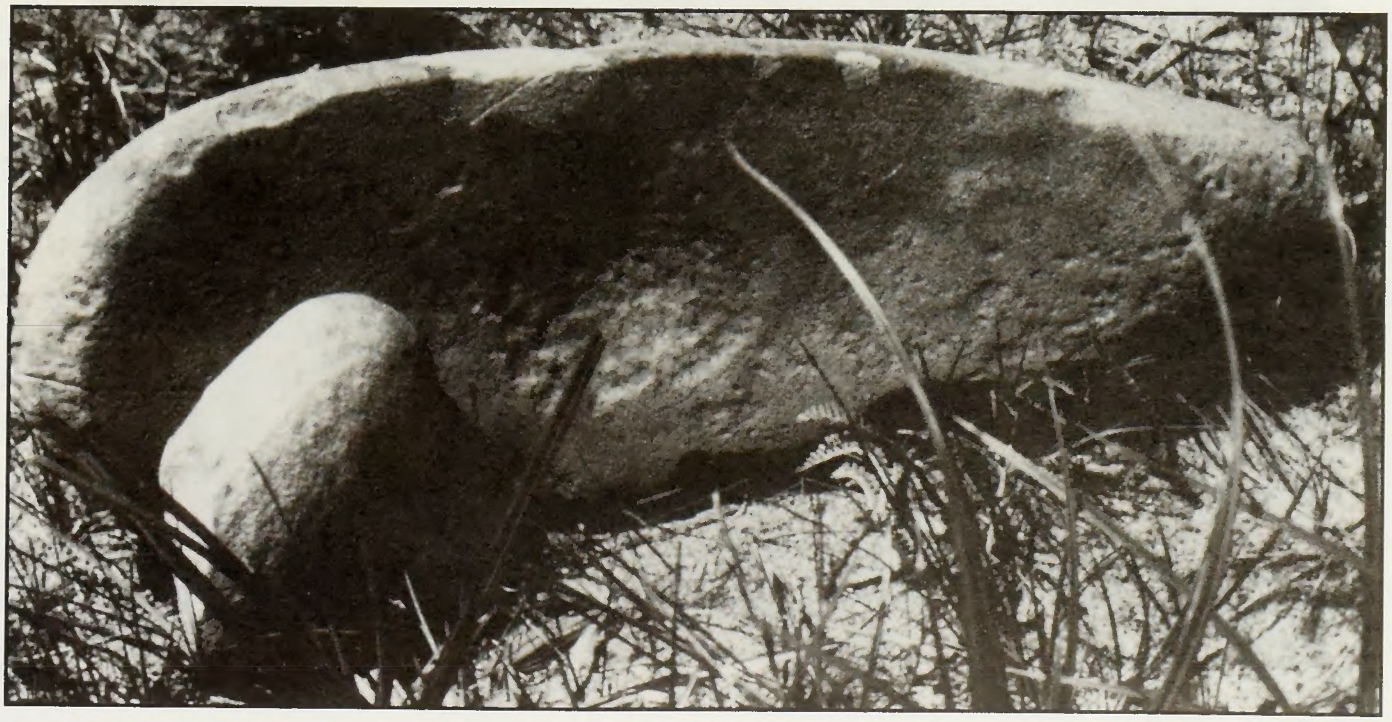
Prehistoric sites in the Coos Bay District represent a broad time span ranging from early archaic 7,000-year-old sites, to sites occupied at the time of Native American removal from southwest Oregon in 1856. Some traditional lifeways were practiced on Indian allotments adjacent to District lands into the early 20th century. Appendix III-L of the draft RMP describes the Cultural Resource Inventory procedures.

The 80 prehistoric sites identified on BLM-administered lands in the planning area represent a wide diversity of environmental settings and activities, including offshore islands, marine, estuarine, locustrine, riverine, upland meadow, and ridgetop locations. Evidence of prehistoric activities include semi-permanent villages, rock shelters, shellfish, vegetation, hunting, and fishing camps; quarry and lithic manufacturing sites; traditional use sites; and cemetery, vision quest, and other religious sites. This site diversity offers unique opportunities for research and interpretation. One prehistoric site has been listed on the National Register of Historic Places, and eight others are deemed eligible for listing.

Historic records for the planning area date from Spanish exploration of the coast in the 1540s. However, intensive Euro-American settlement did not occur in southwest Oregon until the 1850s. Sites of historical significance within the planning area include two gold rush towns (Randolph and Summersville) with associated cemeteries, numerous placer gold mines, trails used by early explorers and later by homesteaders, donation land claims and homestead claims, cabin sites, logging camps, railroads, splash dams, plank roads, tunnels and trestles, fire lookouts, Civilian Conservation Corps camps, lifesaving and naval stations, and lighthouses. Opportunities for interpretation of historic sites are outstanding.

There have been 348 historic sites inventoried within the planning area. One site has been placed on the National Register of Historic Places, and three others are deemed eligible for inclusion.

Nineteen paleontological sites are on BLM-administered lands within the planning area. These include flora and/or fauna from the Jurassic, Cretaceous, Eocene, Oligocene, Miocene, Pliocene, and Pleistocene periods. Most sites consist of marine invertebrates, but vertebrate fossils are present in at least two locations.



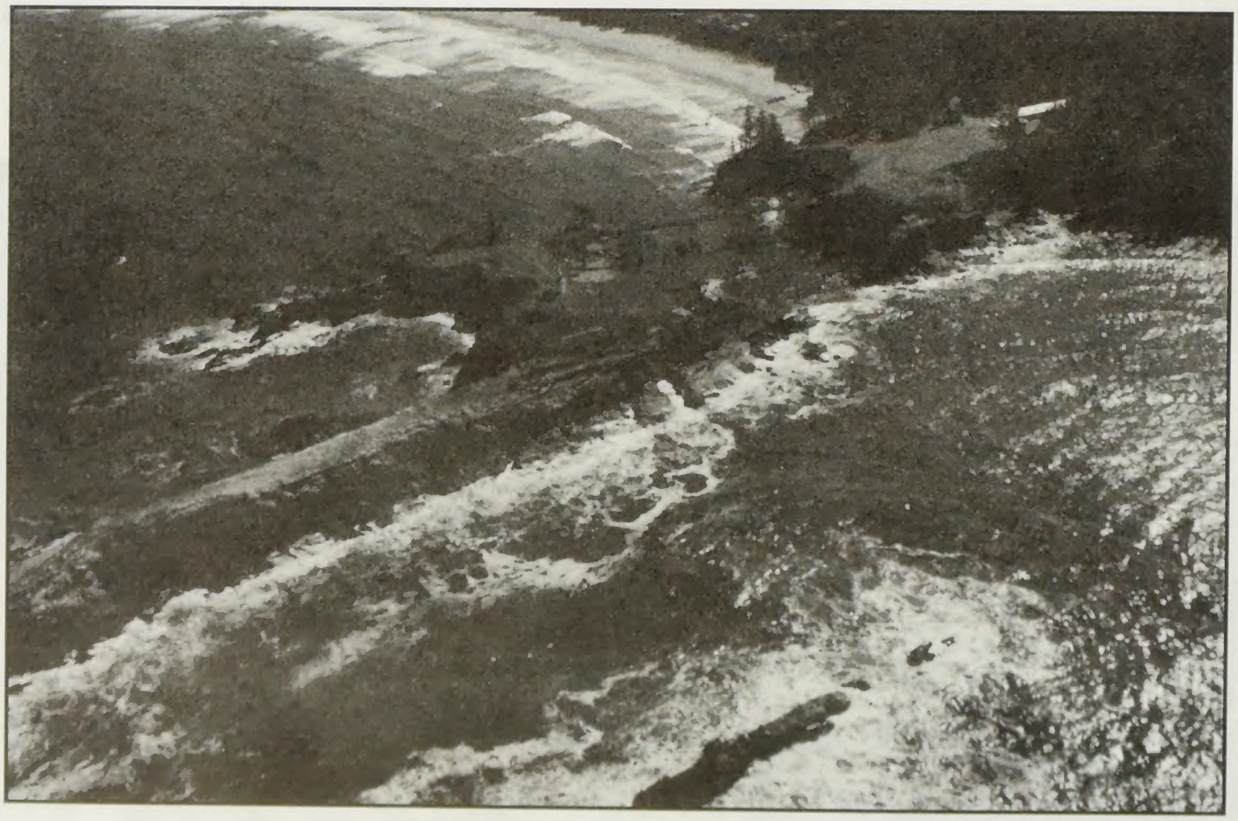
Visual Resources

Visual resources are the land, water, and vegetation structures, and other natural features or cultural modifications that make up the scenery of BLM-administered lands. To facilitate consideration of visual resource (scenic) values in planning, BLM-administered lands have been inventoried, evaluated and assigned inventory classes according to their relative importance from a visual resource management (VRM) point of view. There are four visual resource inventory classes established by BLM manual standards. (See BLM Handbook H-8410-1 for a detailed description of the inventory classes.) These inventory classes range from class I, the most scenic and therefore the most sensitive to changes made on the landscape, to class IV, the least scenic and also least sensitive to landscape modification.

Objectives for each inventory class are used to identify management prescriptions that would maintain, enhance or preserve scenic values. These objectives and management prescriptions are described in Chapter 2.

Of all BLM-administered land inventoried in the district, less than one percent is visual resource inventory class I, 5 percent is class II, 20 percent is class III, and 75 percent is class IV. Acreages of each inventory class are listed in Table 2-1 (alternative D column), and the classes are delineated on Map 3-7. Most of the planning area has fragmented land ownership patterns with non-BLM lands dominating the landscape. The majority of the private lands are intensively managed for timber production, limiting the BLM's ability to effectively manage visual qualities on viewsheds.

The 590 acres of class I land in the planning area are located in the Squaw Island Wilderness Area, North Sisters Rocks and Zwagg Island Wilderness Study Areas, and Cherry Creek RNA. Representative class II areas include lands along the Umpqua and Rogue River corridors, Mill Creek Road, Highway 101 and Coquille Valley. Land adjacent to most county roads in rural residential areas (such as along the Coos River and Coos Bay Wagon Road) are typically inventory class III. Land adjacent to most logging access roads and other seldom seen areas are generally inventory class IV.



Wild and Scenic Rivers

BLM uses a three-step wild and scenic river study process. The first step is to determine eligibility, the second step is to determine potential classification, and the third step is to determine suitability. Final decisions concerning designation of Wild and Scenic Rivers is reserved by Congress.

Determinations of eligibility and potential classification, using the Wild and Scenic River criteria listed in Appendix II-G of the draft RMP, were completed in 1991. Determination of suitability is accomplished through this planning process. Documentation for these determinations is maintained in the Coos Bay District Office.

The Coos Bay District manages no lands within potential or established corridors of any Congressionally-designated Wild and Scenic River.

Table 3-39 and Map 3-8 show river stretches in the planning area which have been designated by Congress under the Wild and Scenic Rivers Act.

The Nationwide Rivers Inventory identified a 77.5-mile segment of the Umpqua River which crosses or is within 0.25 mile of BLM-administered lands in the planning area as probably qualifying for addition to the National Wild and Scenic River System. Eleven segments of other rivers have potential for national wild, scenic, or recreational river designations. To each of these river segments, BLM has applied eligibility and classification criteria as established in U.S. Department of the Interior-Department of Agriculture Guidelines for evaluating a corridor extending 0.25 mile on each side of the segment. The status of eligibility determinations for these rivers is shown in Table 3-40.

Since these 11 river segments meet eligibility criteria for designation, based on their free flowing character and outstandingly remarkable values (see Map 3-8), they would be eligible for suitability studies. Seven of these rivers which are located in areas where BLM-administered lands provide substantial control of the segment are being studied in this RMP process to determine their suitability for wild and scenic river designation.

Table 3-39. Designated Wild, Scenic and Recreational Rivers [1]

	Total River Miles	River Miles Designated Federal Wild & Scenic River System			River Miles Designated State Scenic Waterway		
River		Wild	Scenic	Recreational	Natural	Scenic	Recreational
Rogue	48	12.75	7.5	17.0	12.75	7.5	17.0
Illinois	32	28.2	0	3.8	28.2	0	3.8
Chetco 55	25.5	8	11	0	0	0	
Elk	30	0	0	17	0	0	17
North Fork Elk	5	2	0	0	5	0	0
South Fork Elk	5	0	0	0	5	0	0
North Fork Smith 13	8.5	4.5	0	0	0	0	

[1] Located within the planning area but outside the jurisdiction of the Coos Bay District.

Table 3-40. Status of Eligibility Determinations for Rivers Having Designation Potential

River	Eligibility [1]	Potential Classification	ORV	Total Miles	Percent BLM
Smith River [2]	Yes	Recreational	F,W	61.0	25.0
Wassen Creek [2]	Yes	Recreational	F,W,E	4.0	100.0
Umpqua River	Yes	Recreational	S,R,G,F,H,P,E	70.0	0.5
South Fork Coos River	Yes	Recreational	R,F	37.0	0.5
North Fork Coquille River [2]	Yes	Recreational	F,W	42.0	14.0
East Fork Coquille River [2]	Yes	Recreational	F,W	32.5	23.0
South Fork Coquille River	Yes	Recreational	F,P	35.0	0.2
New River [2]	Yes	Scenic	S,F,G,E,W	9.5	50.0
Sixes River	Yes	Recreational	F,H	28.0	0.7
South Fork Pistol River [2]	Yes	Recreational	F,W	12.0	20.0
North Fork Chetco River [2]	Yes	Recreational	F,H	11.0	27.0

[1] A river segment is eligible for inclusion in the National Wild and Scenic Rivers System if it is free-flowing and has one or more outstandingly remarkable values.

[2] Rivers BLM will study for suitability for designation.

Abbreviations used in this table:

ORV = Outstandingly remarkable value
F = Fish
E = Ecological
H = Historic
G = Geological
P = Prehistoric
R = Recreational
S = Scenic
W = Wildlife

Recreation

The major recreation activities occurring on BLM-administered land in the planning area are camping, picnicking, hiking, horseback riding, general sightseeing (driving for pleasure, viewing scenery, wildlife observation, nature photography), hunting, fishing, and driving motorized vehicles on and off roads. Some activity is concentrated in developed recreation sites (see Table 3-41), but most is dispersed recreation activity occurring on roads, streams and rivers, and undeveloped forest lands.

Resources and Sites

Based on resource management planning guidance established in November 1986, all BLM-administered land is categorized into two distinct types of recreation management areas—Special Recreation Management Areas (SRMAs) and Extensive Recreation Management Areas (ERMAs). (See the glossary for definitions of these terms). These recreation management categories did not exist and therefore were not used in the 1983 plan. However, SRMAs and ERMAs are an integral part of the inventory for the 1990s Resource Management Plan. Typically, SRMAs are management units, sites, or areas requiring substantial recreation investment and/or more intensive recreation management, or those areas in which the majority of recreation program funding is focused. The SRMA identification is applied to various types of areas such as high-use recreation sites, wilderness areas, wild and scenic rivers, ACECs, special areas, and other large areas where the provision of recreation opportunities is a principal management objective. Existing SRMAs in the planning area inventory include Loon Lake/East Shore Recreation Sites, Dean Creek Elk Viewing Area, Coos Bay Shorelands, and the New River Area of Critical Environmental Concern. Three potential SRMAs and several potential acquisitions to expand existing SRMAs are described in Table 3-42. (Note: The term "potential" as applied to recreation opportunities includes those sites and areas that were identified in the reinventory for this planning effort as having potential for management and/or development for recreation use.) A complete list of existing and potential SRMAs, including potential wilderness areas, and wild and scenic rivers, in the planning area can be found in Appendix III-M of the draft RMP.

ERMAs include all BLM-administered land not within SRMA boundaries. The majority of 1990 recreation visitation on BLM-administered lands occurred in the district's three existing ERMAs - Umpqua Resource Area (approximately 120,900 acres and 454,000 visits), Tioga Resource Area (approximately 99,700 acres and 460,000 visits), and Myrtlewood Resource Area (approximately 105,350 acres and 402,000 visits).

Within the planning area there are 11 BLM-developed and managed recreation sites; 4 miles of developed hiking trails; 356 miles of stream supporting fishable populations of trout and salmon; approximately 329,000 acres legally accessible to the public for hunting and other recreational pursuits; and 1,570 miles of BLM-controlled roads open to motorized travel.

Existing and potential recreation sites are described in Table 3-41 and displayed on Map 3-9. For potential SRMAs, see Table 3-42 and Map 3-9; for existing and potential trails, see Table 3-43 and Map 3-9.

In addition to the BLM-developed and managed recreation sites, Coos County has developed and maintains two existing sites (Laverne and Frona Parks) and has three potential sites (Rock Prairie, Middle Creek and Judge Hamilton) located on BLM-administered land.

A recently initiated program within BLM is the national back country byways. The purpose of this program is to identify and publicize scenic driving opportunities on lesser travelled roads through BLM-administered lands. There are currently five proposed national back country byways in the planning area, ranging from 28 to 58 miles in length and totaling 155 miles.

A self-guided driving tour focusing on forest ecology and management is also proposed. The proposed Brummit Fir (also known as the Doerner Fir) Driving Tour is 60 miles in length, incorporates 6 wayside stops to view and learn about different forest age stands, and includes a 0.5-mile interpretive hiking trail at the Brummit Fir as well as 4 short hiking trails (0.125 to 0.25 miles in length) into other forest stands.

Additional demands are being made on BLM-administered lands as a result of new technologies in recreational equipment and increased public interest in certain activities. An example of new technology and increasing popularity is the sailboard used in the water-based activity of windsurfing. The North Spit of Coos Bay offers potential as a windsurfing staging area, and parts of Coos Bay have strong spring and

Table 3-41. Existing and Potential Recreation Sites

Site	Acres	1990 Visits [1]	Recreational Features
Existing			
Loon Lake [2] (Douglas Co.)	80	102,100	61 camp units including 8 tent sites, 34 picnic units, boat launch, dump station, amphitheater.
East Shore Loon Lake [2] (Douglas Co.)	54	21,300	10 camp units, 1 picnic unit, boat dock on Loon Lake.
Dean Creek Elk [2] Viewing Area (Douglas Co.)	1,039	450,000	Visitor center, 2 parking areas.
Smith River Falls (Douglas Co.)	75	2,500	8 camp units on the Smith River.
Vincent Creek (Douglas Co.)	4	800	6 camp units, 5 picnic units.
Big Tree (Coos Co.)	18	500	6 picnic units on Cherry Creek.
Park Creek (Coos Co.)	60	1,000	15 camp units.
Burnt Mountain Cabin (Coos Co.)	38	500	4 camp units.
Coos Bay Shorelands [2] (Coos Co.)	1,662	65,500	Undeveloped recreation area primarily on North Spit Coos Bay but also includes 90 acres on Coos Head; proposed developments include access, parking, camping area, approximately 10 miles of hiking and interpretive trails, interpretive sites, bicycle trails, and commercial development.
North Spit Boat Ramp [3] (Coos Co.)	5	N/A	Two-lane boat launch, 65-space vehicle and trailer parking lot, and restrooms. Proposed additional developments include a crabbing and fishing dock, windsurfing parking and rigging site, and pedestrian interpretive sites.
New River [2] (Coos & Curry Counties)	883	N/A	The New River area is designated as an ACEC and a SRMA featuring watchable wildlife, fishing, beachcombing and photography. Proposals include development of approximately 3 miles of trail, parking, restrooms, an administrative site, and an environmental interpretation program.

Table 3-41. Existing and Potential Recreation Sites (continued)

Site	Acres	1990 Visits [1]	Recreational Features
Bear Creek (Douglas Co.)	77	12,000	9 camp units, 8 picnic units on Bear Creek adjacent to Highway 42.
Sixes River (Curry Co.)	160	10,000	22 camp units on Sixes River. Opportunities exist for expansion of day use, tent camping and children play areas. Cooperation with adjacent landowners to use the "Eckley Trail" for hiking is proposed.
Palmer Butte (Curry Co.)	40	400	4 day-use/picnic units.
Potential (see potential SRMAs for additional potential sites)			
Fawn Creek (Douglas Co.)	5	1,000	Day-use area and boat ramp site at confluence of Fawn Creek and Smith River.
Big Bend (Douglas Co.)	200	N/A	Campground and nature trail on the Upper Smith River.
Camp Creek (Douglas Co.)	41	200	Campground on Camp Creek.
Smith River Log Dump (Douglas Co.)	5	N/A	Day-use/picnic site and historical logging industry interpretive site on Smith River.
Smith River Boat Ramp (Douglas Co.)	1	N/A	Boat ramp/parking area upstream of Smith River Falls.
Vincent Creek Boat Ramp (Douglas Co.)	1	N/A	Boat ramp at the confluence of Vincent Creek and Smith River.
Sawyer Rapids (Douglas Co.)	1	N/A	Boat ramp on the Umpqua River.
Umpqua Lighthouse (Douglas Co.)	80	2,000	Recreation use/development adjacent to the South Jetty of the Umpqua River at Winchester Bay.
McKinley Camp (Coos Co.)	10	500	Campground and day-use area on Middle Creek.
Tioga Basin (Coos Co.)	30	100	Campground on Tioga Creek.
Blue Ridge (Coos Co.)	105	N/A	Rifle range; mountain biking area, near Coos Bay.

Table 3-41. Existing and Potential Recreation Sites (continued)

Site	Acres	1990 Visits [1]	Recreational Features
Middle Creek Falls (Coos Co.)	18	N/A	Camping and day-use area at Middle Creek Falls.
Vaughn's Tree (Coos Co.)	5	N/A	Day-use and camping area.
Goldbrick Road Boat Ramp (Coos Co.)	1	N/A	Boat ramp on the East Fork Coquille River.
East Fairview Boat Ramp (Coos Co.)	6	N/A	Boat ramp on the North Fork Coquille River.
Rock Prairie Boat Ramp (Coos Co.)	0	N/A	Boat ramp on the North Fork Coquille River within the Rock Prairie County Park.
Elk Creek Boat Ramp (Coos Co.)	1	N/A	Boat ramp on the East Fork Coquille River at the Elk Creek Bridge.
Frona Boat Ramp (Coos Co.)	1	N/A	Boat ramp on the East Fork Coquille River at Frona County Park.
Sixes River Boat Ramps (Curry Co.)	40	N/A	Two boat ramp sites on the Sixes River.
Cape Blanco [4] (Curry Co.)	47	N/A	Interpretation of maritime history and aboriginal pre-history at the Cape Blanco Lighthouse site.
South Sister Rock [5] (Curry Co.)	28	N/A	Picnic/day-use area and access point to North Sisters Rock Wilderness Study Area.

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[1] Visitation estimates are derived from traffic counts at selected locations, receipt envelopes collected at Loon Lake and East Shore recreation sites, and observations by district employees. Note that these figures represent visits and not visitor days. Visitor days may be several times greater than number of visits for any recreation site, especially camping areas.

[2] Existing recreation sites or areas that are designated SRMAs. Accordingly, these sites/areas appeared in Appendix III-M of the draft RMP as existing SRMAs.

[3] This boat ramp site is within the existing Coos Bay Shorelands SRMA also described in this table.

[4] Potential sites that would require land acquisition through withdrawal relinquishment for recreational use and development. Not shown on Map 3-9.

[5] Potential sites that would require land acquisition through exchange, purchase or easement for recreational use and development.

N/A means not available or not applicable.

Source: WODDB, Analysis of Management Situation and Coos Bay District recreation inventory records, including the 1990 Recreation Management Information System (RMIS).

Table 3-42. Potential Special Recreation Management Areas

SRMA	Acres	1990 Visits	General Description
Sixes River (Curry Co.)	200	N/A	Contains the Sixes River recreation site; BLM-administered lands along the Sixes River corridor provide fishing, boating, camping, picnicking, and recreational gold panning and dredging. There is potential for nature study opportunities and for interpreting historic mining activities and developments on the South Fork of the Sixes River.
New River Expansion [1] (Coos & Curry Co.)	820	N/A	Potential land acquisitions through purchase, land exchange or conservation easements of dunes/estuarine system suitable for expanded wildlife observation and limited recreational development use appropriate to the site's natural and cultural history emphasis.
Dean Creek Expansion [1] (Douglas Co.)	676	N/A	Potential land acquisitions through purchase or land exchange (Spruce Reach Island between the Umpqua River and Highway 38, and up to 620 acres of upland forested acres) would provide for topographically manageable boundaries, enhance elk and waterfowl habitat management capability, provide expanded environmental education/recreation opportunities, and eliminate existing and potential land use conflicts.
Loon Lake Expansion [1] (Douglas Co.)	40 to 360	N/A	Potential land acquisitions through exchange for adjacent state-owned lands, or special use easement; in addition to the 134 acres that presently comprise the Loon Lake SRMA; to provide additional picnic and camping sites, beach area, as well as additional hiking and nature trails at Loon Lake SRMA.
Coos Bay Shore-lands [1] Acquisitions (Coos Co.)	807	N/A	Potential land acquisitions in addition to the 1,662 acres that presently comprise the Coos Bay Shorelands; includes 314 acres through withdrawal revocation and 493 acres through land exchange, purchase, donation, or purchase of conservation easement; to enhance historical, recreational, wildlife and botanical values, to provide increased or improved public access, bring unique habitats into public ownership, and provide more manageable land ownership patterns.
Gregory Point (Bal'diyaka) (Coos Co.)	21	N/A	Potential public land withdrawal relinquishment of the Coast Guard lighthouse site. Proposed interagency cultural heritage interpretive center with public access to the historic Cape Arago lighthouse; cultural and natural history oriented recreation opportunities related to the site's significant cultural, historic, scenic and biological resources.

Table 3-42. Potential Special Recreation Management Areas (continued)

SRMA	Acres	1990 Visits	General Description
Tioga (Coos Co.)	25,440	N/A	Contains three existing recreation sites, recreational improvements at the Doerner Fir, one proposed ACEC (China Wall), one proposed recreation site (McKinley Camp), and one proposed trail project (Vaughn's Creek). This area contains the most contiguous public lands within the Resource Area with the highest potential for recreation opportunities, including fishing, hiking, hunting, camping, and nature study .

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[1] Potential expansion of an existing SRMA. See Appendix III-M of the draft RMP for more information on existing SRMAs.

N/A means not available or not applicable.

Source: WODDB and Coos Bay District recreation inventory records.

Table 3-43. Existing and Potential Recreation Trails

Trail	Miles	1990 Visits [1]	General Description
Existing			
Loon Lake Waterfall	0.25	3,000	Short foot trail from Loon Lake day-use area to small waterfall on boundary of Elliott State Forest.
Big Tree	0.25	500	Short foot trail from the recreation site to an unusually large Douglas-fir tree.
Brummit Creek	0.5	N/A	Interpretive signing and trailhead to world's largest recorded living Douglas-fir tree (the Doerner Fir). Visitation in 1993 is estimated at between 1,000 and 2,000 visits.
New River	3	N/A	Interpretive hiking trails centered in the area of the "Storm Ranch", including the potential for three wheel-chair accessible trails.
Potential			
Roman Nose/ Kentucky Creek	6	N/A	Foot trail access from Roman Nose Mountain (potential scenic overlook site) to USFS trail system in the Kentucky Creek drainage of Siuslaw N.F.
Wassen Creek	17	N/A	Foot access from Wassen Lake through a large block of mid-age Douglas-fir stands to Smith River, across BLM and USFS lands.
Middle Creek	0.25	N/A	Short foot trail providing access from McKinley Camp to Middle Creek.
North Fork Coquille	3	N/A	Foot trail providing access to North Fork Coquille River waterfalls.
Vaughn's Creek	1.5	N/A	Foot trail between Vaughn's Creek and Vaughn tree potential recreational/natural history site.
Bear Creek - Panther Ridge	4	N/A	Foot trail providing access to Panther Ridge area from Bear Creek recreation site.
Upper Rock Creek	2	N/A	Foot trail to provide access from a trailhead into an old-growth Douglas-fir and western redcedar stand in the Upper Rock Creek area.
Hunter Creek Bog	1	N/A	Foot trail into the botanically unique Hunter Creek Bog. Visitation in 1993 is estimated at between 200 and 300.
North Fork Hunter Creek	6	N/A	Foot trail into the regionally unique Jeffrey Pine stands in the North Fork Hunter Creek Area.

Table 3-43. Existing and Potential Recreation Trails (continued)

Trail	Miles	1990 Visits [1]	General Description
Camp Myrtlewood	2	N/A	Nature trail on BLM-administered lands adjacent to privately-owned Camp Myrtlewood.
Palmer Butte [2]	4-18	N/A	A loop or one-way trail through chaparrel and conifer habitats with exceptional vista points.

[1] The most current recreation visitation estimates for BLM-administered trails are for 1990. Visitation estimates were derived by professional estimates based on observations by district employees.

[2] Location not shown on Map 3-9.

N/A means not available or not applicable.

Source: WOODDB, Analysis of Management Situation, and Coos Bay District recreation inventory records including the 1990 Recreation Management Information System (RMIS).

summer seasonal winds that provide excellent windsurfing conditions. Another activity increasing in popularity in the planning area, partially due to technological advances, is mountain biking. The district's 1,570 miles of forest roads provide the public opportunities for this recreational pursuit.

Recreation Use and Demand

Recreation use of BLM lands, including all activities occurring within existing SRMAs and ERMAs, was estimated to be almost 1.3 million recreation visits in 1990. This estimate is based on data in the 1988 Statewide Comprehensive Outdoor Recreation Plan (SCORP) for Oregon (OPRD 1988). Despite several weaknesses, SCORP estimates are the most recent and reliable database available for estimating district-wide recreational use. The SCORP estimates were prorated to lands under BLM jurisdiction based on percent of forest land administered by BLM in SCORP regions 6 and 9.

The SCORP estimates reflect only those recreational visits made by Oregonians in Oregon, not by out-of-state users. Some sites in the Coos Bay District receive out-of-state visitation. Among these sites, Dean Creek Elk Viewing Area and the North Spit (Coos Bay Shorelands) are the most notable, although Loon Lake, Bear Creek, and Sixes River Recreation Sites also receive a small amount (10 to 20 percent of total camping use) of out-of-state use. Out-of-state visitation rates could increase as the region continues to develop and promote itself as a tourism destination, and as new recreation opportunities on public lands are developed. Specific recreation opportunities expected to increase tourism are the proposed cultural heritage interpretive center at the Gregory Point Lighthouse site (also known as Bal'diyaka), the potential acquisition of the Cape Blanco Lighthouse facility, and potential recreation improvements at the North Spit and New River ACECs.

Table 3-44 shows total 1990 and projected year 2000 recreation visits to BLM-administered land for 10 separate use categories. These are BLM-specific figures based on the SCORP database (OPRD 1988).

Projected visits for the year 2000 are based on an assumption of constant, or "no growth", supply of recreation facilities or resource opportunities. An upward or downward change in supply could have a corresponding effect on projected visits. Potential developments at the Gregory Point Lighthouse site, and at the North Spit and New River ACECs would almost certainly result in visitor numbers significantly higher than those under a "no growth in supply" assumption.

Motorized travel (sightseeing and exploring) and other land-based visits (nature study, wildlife observation, outdoor photography, visiting interpretive displays and picnicking) accounted for 41 percent of total visitation and were, by far, the most popular recreation activities occurring on BLM-administered land in 1990.

Non-motorized travel visits (visiting the beach/beachcombing, hiking/bicycling off the road and horseback riding) accounted for another 16 percent, while camping (all modes of overnight camping) and fishing each accounted for approximately 11 percent of all visits in 1990. No other use category accounted for more than seven percent of total visitation in that year. These percentages, or activity-shares, of total recreational use are expected to remain at about the same levels through the year 2000 and beyond.

A rapidly-growing activity not fully accounted for in Table 3-44 is windsurfing, or board-sailing, on Coos Bay. Windsurfing users include both local area residents and visitors from outside of the region and out-of-state. While data on current use levels is unavailable, anecdotal evidence suggests the use of Coos Bay for this activity is growing rapidly. Local users have contacted BLM about the need and potential for a windsurfing launch area on the North Spit.

Other recreation user groups that have expressed resource and facility needs in the Coos Bay District are mountain bikers, off-highway-vehicle (OHV) users, target shooters, and equestrian groups. Mountain biking, like windsurfing, is growing rapidly. No district-specific data are available, but anecdotal evidence and recent contact with user groups suggest a growing interest in using BLM-administered lands for this activity.

Current use of existing developed recreation sites varies by site, season, weather conditions, and day of the week. For example, the demand for camping use at Loon Lake recreation site is at, or near, design capacity throughout most of the summer season (mid-June to Labor Day). On summer weekends (Friday-Sunday), demand for camping exceeds supply at this site. Day-use at Loon Lake exceeds parking area capacity on most summer weekend days; however, there is a surplus of parking spaces on all but the hottest weekdays. Facility-dependent

Table 3-44. Estimated Recreation Visits to BLM-Administered Land for 1990, and Projected Visits for Year 2000

Recreation Use Category	Estimated Visits 1990 [1]	Percent of Total 1990 Visits	Projected Visits for Year 2000 [2]	Percent Change 1990 to 2000
Off-road travel [3]	85,500	6.8	107,000	25.1
Motorized travel [3,4]	269,200	21.3	349,800	30.0
Non-motorized travel [3]	210,100	16.6	276,800	31.7
Camping [3,5]	134,500	10.7	177,200	31.7
Hunting	51,900	4.1	57,100	10.0
Other land-based use [3,4] (i.e., sightseeing, picnicking, nature study, photography, collecting)	248,300	19.7	336,100	35.4
Fishing [3]	147,900	11.7	193,600	30.9
Boating [5]	59,900	4.7	75,000	25.2
Other water-based use (i.e., swimming, general water play, tubing)	47,900	3.8	57,600	20.2
Winter sports	7,100	0.6	9,200	29.6
Total	**1,262,300 [6]**	**100.0**	**1,639,400**	**29.9**

[1] Derived from 1988 SCORP data using straight line projections of growth in activity participation forecast for 1987-2000. Table does not account for out-of-state visits.

[2] Extrapolated from Hospodarsky, Denver, 1989.

[3] Does not include out-of-state visitation to the North Spit area of Coos Bay Shorelands.

[4] Does not include out-of-state visitation to Dean Creek Elk Viewing Area.

[5] Does not include out-of-state visitation to Loon Lake Recreation Site.

[6] Does not include out-of-state visitation, nor does this figure fully account for Dean Creek visits, as the site was not established when SCORP data was collected. Including these visits, the total 1990 visits would be 1.98 million.

Sources: OSPRD 1988; Hospodarsky 1989; USDI - Bureau of Land Management, Analysis of the Management Situation, 1990.

recreation use levels vary at other developed recreation sites in the district as well; generally, summer weekends are at, or exceed, design capacity, while weekday use is generally at 20 to 50 percent of capacity.

By the year 2000, overall recreational use of BLM-administered lands in the district is expected to increase by approximately 30 percent. The demand for facility-dependent recreational uses is expected to increase by 20 to 35 percent. Accordingly, the demand for use of existing developed sites will increase by the same percentage if no additional recreation sites and facilities are supplied. Depending upon location and site conditions, development of additional recreation sites by BLM or other land managers would lower this expected growth rate in demand for existing BLM-administered recreation sites and facilities.

However, without additional sites, the demand for existing developed sites is expected to reach or exceed design capacity throughout the summer period both on weekdays and weekends, by or before the end of the planning period (year 2002). For the balance of the year when BLM sites are open to public visitation, use is expected to range between 10 and 80 percent of design capacity. The higher use levels for this range will occur in the "shoulder seasons" (e.g., the month or so before and after summer). Demand may exceed design capacity for some developed sites during the "shoulder season" by or before the end of the planning period.

Dispersed recreational use (use that is not facility-dependent) is relatively light at any given time and location in the planning area. Dispersed uses are expected to increase from 10 to 35 percent depending on the recreation use activity by the year 2000. Because there are approximately 325,950 acres in the three ERMAs available to accommodate dispersed uses, it is anticipated that capacity to handle foreseeable demand for these uses will not be exceeded for many decades. However, the perceived quality of recreational experience may change depending upon preferences of the individual users as dispersed recreational use increases.

Timber Resources

In 1977, district lands were inventoried for their physical and biological capabilities to support and produce forest products on a sustained yield basis (BLM Handbook 5251-1). This inventory is the Timber Production Capability Classification (TPCC) system. District lands were reinventoried in 1987 using the current TPCC system, and the results of the TPCC (updated as of October 1, 1988) are displayed on Table 3-45. The TPCC classifications are described in Table 3-46. Differences in terminology, structure and district acreage prevents direct comparisons of the inventories.

Appendix III-N of the draft RMP provides additional information on inventories used.

District forest lands were inventoried in 1978 and 1988 to estimate the volume and age class distribution. Table 3-47 displays a comparison of the volume growing and age class distribution.

Table 3-47 requires some explanation for the differences in acres and volume between 1978 and 1988. This table shows a comparison of the commercial forest land (CFL) acreage used to calculate the maximum Allowable Sale Quantity (ASQ) for 1978 (Unit Resource Analysis 4) and the acreage for 1988 (Alternative A). Some differences in Table 3-47 are identified as follows:

- 1978 acres do not reflect riparian zone acres withdrawn from the CFL base whereas the 1988 acres excluded about 10,800 acres of riparian zone.
- The 1988 TPCC inventory has approximately 14,000 less acres of Suitable Commercial Forest Land than the 1978 TPCC inventory. However, approximately 4,000 of the 14,000 acres are Suitable Woodland that under the 1978 inventory would have been part of the CFL base. The net change is about 10,000 acres.
- The 1978 acres do not include 12,108 acres of hardwood conversion acres. Hardwood conversion acres are included in the 1988 acres.
- Approximately 2,000 acres difference are due to land exchanges, ACECs, parks and other Congressional withdrawals that are subtracted from the 1988 acres and not from the 1978 acres.
- Finally, 1978 acres were based on the Master Title Plat while 1988 acres were based on GIS. Using different systems could account for a difference of 1,000 acres.
- Volume disparity occurs for several reasons: Volume estimates were not made for age class 20 in 1978; a different base acreage was used for 1978 and 1988; and the average cubic foot volume per acre has decreased as old-growth stands are converted to young managed stands. This latter condition will eventually disappear as total growth exceeds total harvest.
- Board foot volume decreased proportionately more than cubic foot volume due to the decrease in the amount of old-growth stands and subsequent decrease in average board foot/cubic foot ratio from 6.25 to 6.10.

Table 3-48 displays the volume by ownership and timbershed as reported in *Timber for Oregon's Tomorrow, the 1989 Update*. The data in this table cannot be compared directly with Table 3-47 as the timbersheds incorporate more than one BLM district.

The South Coast Timbershed is comprised of Coos and Curry counties. The Roseburg Timbershed is comprised of Douglas County. Sixty percent of the Coos Bay District lands are included in the South Coast Timbershed; the remainder are in the Roseburg Timbershed.

Table 3-48 displays that BLM-administered lands within the South Coast Timbershed contain approximately 19 percent of the total available growing stock; within the Roseburg Timbershed, BLM-administered lands contain approximately 30 percent of the total.

Table 3-49 displays the volume of timber harvested by county and ownership. As in Table 3-48, the data presented encompasses harvest from more than one district; however, on the average for the past 10 years, it shows the following percent of harvest originating from BLM-administered land by county: Douglas 25 percent, Coos 23 percent, and Curry 11 percent.

Table 3-50 displays timber management and forest development accomplishments projected for the 10 years in the current plan for the district, and the actual accomplishments from 1984 to 1993.

Table 3-45. TPCC Summary 1988

	Acres[1]			
	O&C	PD	CBWR	Total
Nonforest Land				
Rockland	3,058	445	270	3,773
Brush	0	3	0	3
Grass	41	22	0	63
Water	241	936	25	1,202
Highway	7,240	929	2,111	10,269
Utility	159	11	201	371
Agriculture	24	356	1	381
Nonforest Unclassified	130	1,416	21	1,567
Subtotal	10,893	4,118	2,618	17,629
Nonsuitable Woodland				
Fragile Nonsuitable	21,487	6,119	3,700	31,306
Suitable Woodland				
Low Site	0	818	0	818
Non Commercial Species	0	37	0	37
Nonsuitable Commercial Forest Land (Reforestation Problem)	1,806	117	2,096	4,019
Subtotal	1,806	972	2,096	4,874
Suitable Commercial Forest Land				
Nonproblem	9,076	718	5,780	15,574
Fragile-Suitable	13,447	823	4,224	18,494
Category I CFL	50,751	12,856	25,265	88,872
Category II CFL	694	0	0	694
Combination Reforestation and Fragile Problem	109,835	24,192	15,280	149,307
Subtotal	183,803	38,589	50,549	272,941
Total	**217,989**	**49,798**	**58,963**	**326,750**

[1] Note: Acres based on GIS

Table 3-46. TPCC Classifications

Nonforest Land - Sites within the forest zone that are not capable of maintaining at least 10 percent stocking of forest trees and those sites which have been converted to nonforest uses. These sites are excluded from the timber production base by definition.

Woodland - Woodland is forest land which *is not* included in the Commercial Forest Land allowable harvest base, and also includes all Fragile Nonsuitable Land, Noncommercial Forest Land, and Nonsuitable Commercial Forest Land.

Nonsuitable Woodland - Includes all Fragile Nonsuitable Forest Land and sites that are *not* biologically and/or environmentally capable of supporting a sustained yield of forest products.

Fragile-Nonsuitable - Sites where future production *will be* reduced even if special harvest and/or restrictive measures are applied due to inherent site factors such as soil, geologic materials, topography, and groundwater tables.

Suitable Woodland - Includes all Noncommercial Forest Land and Nonsuitable Commercial Forest Land that *are* biologically capable of supporting a sustained yield of forest products.

Noncommercial Forest Land (Low Site) - Sites that produce less than 20 cubic feet per acre per year of commercial species.

Noncommercial Forest Land (Noncommercial Species) - Sites producing forest tree species (hardwoods) that are typically utilized as non-sawtimber products.

Nonsuitable CFL (Reforestation Problem) - Sites that cannot be reforested to meet or exceed *minimum* stocking levels of commercial species: 1) within 5 years of harvest using artificial regeneration and operational reforestation practices *OR* 2) within 6-15 years of harvest using natural and/or artificial regeneration. These sites are classified as Woodland.

Suitable Commercial Forest Land - Commercial Forest Land determined to be capable of sustaining long-term timber production.

Commercial Forest Land (CFL) - All forest land that is *capable* of yielding at least 20 cubic feet of wood per acre per year of commercial tree species.

Nonproblem - Commercial Forest Land that can be stocked to meet or exceed *target* stocking levels of commercial species within 5 years of harvest using standard practices *AND* that is classified Nonfragile. Standard practice is one site preparation treatment that provides adequate planting spaces (if needed), and one planting following the regeneration harvest.

Fragile-Suitable - Sites where forest yield productivity *may be* reduced due to soil erosion, mass wasting, reduction of nutrient levels, reduction of moisture supplying capacity, and/or rise in groundwater tables.

Category I CFL - Sites that can be reforested within 5 years of harvest using artificial regeneration and operational reforestation practices *OR* natural regeneration.

Category II CFL - Sites that can be reforested within 6 to 15 years of harvest using natural and/or artificial regeneration in all forest types. These sites can have fragile, reforestation, or dual (fragile and reforestation) classifications.

Combination Reforestation and Fragile Problem - Commercial Forest Land that is classified as Fragile-Suitable and where operational reforestation practices, *in addition to* standard practices, are necessary to meet or exceed *minimum* stocking levels of commercial species within 5 years of harvest for Category I lands. The regeneration period for Category II lands is 6-15 years.

Table 3-47. Comparison of District Inventory Data for Commercial Forest Lands (1978 and 1988)

	Acres		Conifer Cubic Volume (MCF)		Conifer Board Foot Volume (MBF)	
Age Class[1]	**1978**	**1988**	**1978**	**1988**	**1978**	**1988**
0	56,488	39,926	0	0	0	0
10	38,489	30,999	0	0	0	0
20	16,890	38,684	0	39,433	0	200,320
30	9,734	24,101	23,326	69,071	123,161	364,695
40	16,341	10,508	52,120	83,863	286,660	461,246
50	4,391	15,064	17,355	29,976	98,056	169,364
60	6,276	7,208	29,405	34,812	170,255	201,561
70	5,400	3,709	29,095	22,872	171,951	135,174
80	11,751	3,826	71,217	28,542	427,302	171,252
90	4,439	3,655	29,754	31,690	180,607	192,358
100	4,084	9,015	29,875	78,804	183,134	483,069
110	12,476	8,259	98,525	74,778	608,884	462,128
120	14,658	5,111	123,847	45,968	771,567	286,381
130	6,092	8,881	54,650	75,192	342,656	471,454
140	1,534	5,635	14,515	56,618	91,444	356,693
150	3,353	2,649	33,275	22,910	210,631	145,020
160	2,279	623	23,599	5,542	149,854	35,192
170	0	1,664	0	12,600	0	80,262
180	3,160	1,252	35,162	11,750	223,982	75,082
190	1,021	7,228	11,709	69,093	75,055	442,886
200	8,571	128	100,956	1,223	648,138	7,852
210	1,021	2,464	12,313	23,409	79,173	150,520
220	0	11,049	0	104,900	0	675,556
230	9,216	144	115,476	1,431	743,665	9,216
240	2,279	1,463	28,989	14,229	186,979	91,777
250	4,889	130	62,970	1,506	406,157	9,714
260	2,536	242	32,992	1,702	212,798	10,978
270	6,937	959	90,939	7,071	586,557	45,608
280	0	278	0	2,561	0	16,518
290	0	8,206	0	77,378	0	498,314
300	5,887	88	77,868	798	501,470	5,139
310	1,021	407	13,483	3,326	86,831	21,419
320	0	704	0	6,323	0	40,657
330	0	47	0	441	0	2,836
340	0	44	0	410	0	2,632
350	5,899	277	75,629	2,437	484,782	15,621
360	0	539	0	4,787	0	30,637
370	459	51	5,713	165	36,506	1,054
380	0	0	0	0	0	0
390	0	1,229	0	10,659	0	67,898
400	3,300	0	38,478	0	244,720	0
410+	3,635	7,615	25,728	61,207	158,484	388,052
TOTAL	**274,506**	**264,061**	**1,358,964**	**1,119,477**	**8,491,459**	**6,826,135**

1978 Avg. BF/CF ratio = 6.25
1988 Avg. BF/CF ratio = 6.10

[1] Age class defines a 10-year period of time, with the mid-point accepted as the age class break. For example, stands in age class 20 have an actual age between 16 and 25 years.

1978 acres based on MTP, 1988 acres based on GIS

Table 3-48. Volume by Ownership and Timbershed

	Forest Land (thousand acres)			Available Growing Stock[1] (million cubic ft.)
	Available	Not Available	Total	
South Coast Timbershed				
Public				
National Forest	287	170	457	819
Bureau of Land Management	167	44	211	642
State and other	59	14	73	331
Private				
Forest Industry	551	0	551	1,177
Non-Industrial	218	0	218	492
Total	1,282	228	1,510	3,461
Roseburg Timbershed				
Public				
National Forest	611	285	896	2,602
Bureau of Land Management	522	77	599	2,206
State and other	39	9	48	219
Private				
Forest Industry	750	0	750	1,586
Non-Industrial	287	0	287	663
Total	2,209	371	2,580	7,276

[1] National Forest growing-stock data are based on 9-inch dbh to a 6-inch top for natural stands and 7-inch dbh to a 4-inch top for managed stands. BLM and state data are based 7-inch dbh to a 4-inch top for all stands. Private data are based on 5-inch dbh to a 4-inch top for all stands.

Source: Timber for Oregon's Tommorow - The 1989 Update

Table 3-49. Volume Harvested by County and Ownership (Thousand Board Feet, Scribner Log Scale) [1]

Year	County	Forest Industry [2]	Other Private [2]	State [2]	BLM [3]	National Forest [4]	Indian [5]	Other Public [2]	Total
1983	Douglas	677,539	36,411	2,297	217,103	318,592	0	0	1,251,942
	Coos	191,367	6,122	33,145	82,009	35,115	0	8,735	356,493
	Curry	57,878	3,369	1,529	15,551	0	0	0	78,327
1984	Douglas	646,848	32,880	11,015	261,391	324,498	0	1,833	1,278,465
	Coos	231,306	11,575	16,741	91,578	63,374	0	5,440	420,014
	Curry	56,031	2,994	0	19,951	16,073	0	0	95,049
1985	Douglas	636,113	35,692	23,779	290,188	327,008	0	286	1,313,066
	Coos	241,388	15,253	51,925	92,650	37,887	0	10,895	449,998
	Curry	34,306	6,143	2,049	17,482	65,499	0	0	125,479
1986	Douglas	591,435	38,227	31,608	349,410	492,455	0	50	1,503,185
	Coos	269,545	30,268	21,604	132,014	33,188	0	4,549	491,168
	Curry	43,955	4,164	2,894	16,518	95,563	0	0	163,094
1987	Douglas	471,437	30,854	21,645	378,054	406,283	0	3,274	1,311,547
	Coos	263,047	23,338	25,574	132,011	29,585	0	16,278	489,833
	Curry	29,301	8,491	2,181	3,141	101,693	0	0	144,807
1988	Douglas	325,008	45,532	28,221	545,351	377,143	0	2,124	1,323,379
	Coos	232,948	28,608	24,051	190,205	28,681	0	10,404	514,897
	Curry	44,628	4,827	4,090	11,610	103,380	0	285	168,820
1989	Douglas	338,040	83,095	18,685	341,824	448,583	0	6,754	1,236,981
	Coos	263,553	51,958	21,662	123,865	20,193	0	5,198	486,429
	Curry	29,398	9,201	2,640	23,428	102,647	0	0	167,314
1990	Douglas	385,500	62,962	25,649	213,854	291,334	0	1,001	980,300
	Coos	236,289	44,045	19,044	73,416	29,010	0	7,569	409,373
	Curry	63,713	9,070	0	13,452	36,270	0	0	122,505
1992	Douglas	288,368	75,350	9,704	145,099	118,889	0	1,586	638,996
	Coos	223,459	52,573	15,524	37,072	9,573	0	9,860	348,061
	Curry	58,869	24,766	0	3,175	21,459	0	0	108,269

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[1] Includes volume removed (softwood and hardwood) as logs, poles and pilings but not volume removed from woodcutting operations.
[2] Compiled by Oregon State Department of Revenue.
[3] Compiled by Bureau of Land Management.
[4] Compiled by United States Forest Service, Region 6.
[5] Compiled by U.S. Bureau of Indian Affairs.

Source: Oregon Timber Harvest Reports, Oregon State Department of Forestry

Table 3-50. Timber Management and Forest Development Accomplishments

Practice	Average Annual Planned for 10 years	Average Annual Accomplished In 10 years[3]
Allowable Harvest Sold		
Million Cubic Feet	39.9	22.0
Million Cubic Feet Buyback[1]	0	4.3
Million Board Feet	254	144.2
Million Board Feet Buyback[1]	0	28.7
Harvest Acres Sold		
Clearcut Acres	4,000	2,604
Clearcut Acres Buyback[1]	0	473
Site Preparation Acres		
Broadcast Burning	4,900	2,453
Herbicide	850	0
Other[2]	0	1,149
Brush and Hardwood Conversion Acres	550	8
Planting Acres		
Normal Stock	5,700	2,823
Genetic Stock	800	953
Animal Damage Control Acres	950	
Tubing		2,671
Trapping/Baiting		76
Plantation Release Acres	5,100	
Herbicide		0
Manual		2,379
Precommercial Thinning Acres	3,350	1,692
Fertilization Acres	4,500	3,785

[1] Volume and acres sold as a result of "Buyback" legislation in 1984. Timber bought back by BLM was resold as part of regular sale commitment.

[2] Other practices include forage seeding, spot burning or hand piling.

[3] Data as of 1993

Annual accomplishments have deviated from planned activities for the following reasons:

- The allowable harvest volume sold and harvested has been constrained since 1989 to avoid potential impacts on the northern spotted owl or its habitat.
- Volume was sold and harvested as a result of “buyback” legislation in 1984.
- The reduction in acres harvested reduced the acres requiring site preparation. Alternative site preparation treatments (spot burning, hand piling, or forage seeding) reduced the need to broadcast burn areas.
- Reduced funding levels resulted in not accomplishing the brush and hardwood conversion acres projected.
- A court injunction prevented any use of herbicides on federal lands during the period of the plan. The acres needing animal damage protection have been greater than anticipated.

Table 3-51 displays the number of acres by age class that have been subjected to intensive management practices to October 1, 1993. Only the most intensive treatment is shown to avoid double counting of acres.

Douglas-fir is the most important commercial species on the district, comprising approximately 85 percent of the standing volume. Western hemlock, western redcedar, true fir, Port-Orford-cedar, Sitka spruce, incense-cedar, and sugar pine are the other commercial coniferous species. Red alder, bigleaf maple, tan oak, Oregon myrtle, chinquapin and madrone are merchantable hardwood species.

See the Vegetation section for a description of seral stages and special forest products. The Biological Diversity section describes forest health.

Table 3-51. Stand Treatment Accomplishments by Age Class (in acres)[1]

Age Class	Imp Stock	PCT	Imp Stock and PCT	Fert.	PCT and Fert	Imp Stock and PCT & Fert	PCT and Fert and CT	PCT and CT	CT	Total Acres [2]
0	8,521	0	0	0	0	0	0	0	0	8,521
10	1,844	3,022	51	2,784	1,523	24	0	0	0	9,248
20	9	1,496	0	2,383	18,454	6	0	0	0	22,348
30	0	424	0	357	9,369	0	0	0	0	10,150
40	0	410	0	15	1,784	0	0	0	0	2,209
50	0	42	0	230	1,099	0	0	0	379	1,750
60	0	0	0	0	0	0	0	0	896	896
70	0	0	0	0	0	0	0	0	15	15
80 +	0	0	0	0	0	0	0	0	0	0

[1] As of 1993
[2] Acres have not been double counted

Abbreviations used in this table:

PCT = Precommercial Thinning
Fert = Fertilization
CT = Commercial Thinning
Imp Stock = Planted genetically improved stock

Energy and Mineral Resources

Since 1980, mineral activity on BLM-administered lands in the planning area has consisted primarily of rock production for the construction and maintenance of BLM and private logging roads, county and state roads, and federal highways. Some oil and gas exploration activity as well as gold, nickel, cobalt, silica and platinum exploration has occurred within this time frame. Exploration for locatable minerals has been minimal with only two notices and no plans of operation filed in the last 10 years. Both notices were for placer gold exploration. Leasable mineral exploration consisted of 12 notices of intent to conduct geophysical work for oil and gas exploration. From January 1, 1980 to December 31, 1992, over 550 oil and gas leases covering 221,000 acres were issued. Most of these leases were relinquished or terminated due to the drop in world oil prices.

As of January 1, 1993 there were approximately 2,800 mining claims within the district boundary; however, only 40 were located on BLM-administered lands. No active mining notices or plans of operation are on file at this time. Fourteen oil and gas leases covering only a few hundred acres are now on file. There are no oil and gas notices of intent presently on file. Rock production from BLM quarries and pits is about 2,000 cubic yards per year from 20 active sources. The vast majority, approximately one million cubic yards of road building material each year, come from private sources. The BLM administers the mineral estate for approximately 329,200 acres of public land and 12,200 acres of split estate (federally-owned minerals with non-federally owned surface).

Based upon the geological environment, exploration activity, geophysical and other ongoing studies, there is potential for the occurrence of the following locatable minerals: gold, silver, copper, nickel, cobalt, platinum and silica. Leasable mineral potential in the planning area includes oil and gas resources. Recent studies identified potential source rock and a trapping mechanism in the southern portion of the Tyee Basin which suggest that a high potential for oil and gas may exist. This would involve the entire central portion of the planning area.

There are no known geothermal resources in the planning area.

The Coos Bay coal field lies within the planning area. This field began production around the turn of the century and continued into the 1920s. The coal proved to be very low quality, containing high quantities of ash and sulphur. Also, the seams are thinly bedded for the most part, averaging approximately 30 inches in depth, and are steeply dipping making extraction very difficult. Only a few scattered tracts totaling less than 1,000 acres under BLM administration fall within the coal field.

It is the Bureau's policy to encourage exploration and development of minerals using environmentally sound practices. Tables 3-52 through 3-54 summarize the acres and mineral potential for locatable, salable, and leasable minerals. Map 3-10 displays the areas of potential coal and locatable minerals. Map 3-11 displays the areas of potential for oil and gas leasable minerals. A salable mineral resource map is not available because of the extremely variable nature of the resources. Mineral potential, as used in this document, refers to the potential for the occurrence, not the development, of a mineral.

There are no known Areas of Critical Mineral Potential in the planning area.

Table 3-52. Locatable Mineral Potential [1]

Management Categories	Potential (in acres)			
	Low or Unknown	Moderate	High	Total
Closed-Nondiscretionary	1,000	0	300	1,300
Closed-Discretionary	2,800	1,400	1,600	5,800
Open-Standard Requirements	282,500	21,900	9,400	313,800
Open-With Additional Restriction	6,400	1,500	800	8,700

[1] (Does not include mineral reserve lands)

Table 3-53. Oil and Gas Mineral Potential

Management Categories	Potential (in acres)			
	Low or Unknown	Moderate	High	Total
Closed-Nondiscretionary	400	200	1,000	1,600
Open-No Surface Occupancy	600	300	1,200	2,100
Open-Standard Stipulations	80,200	48,000	192,400	320,600
Open-With Additional Restrictions	1,300	900	3,100	5,300

Table 3-54. Geothermal Mineral Potential

Management Categories	Potential (in acres) Low or Unknown	Moderate	High	Total
Closed-Discretionary	0	0	0	0
Closed-Nondiscretionary	100	0	0	100
Open-With Constraints	329,500	0	0	329,500

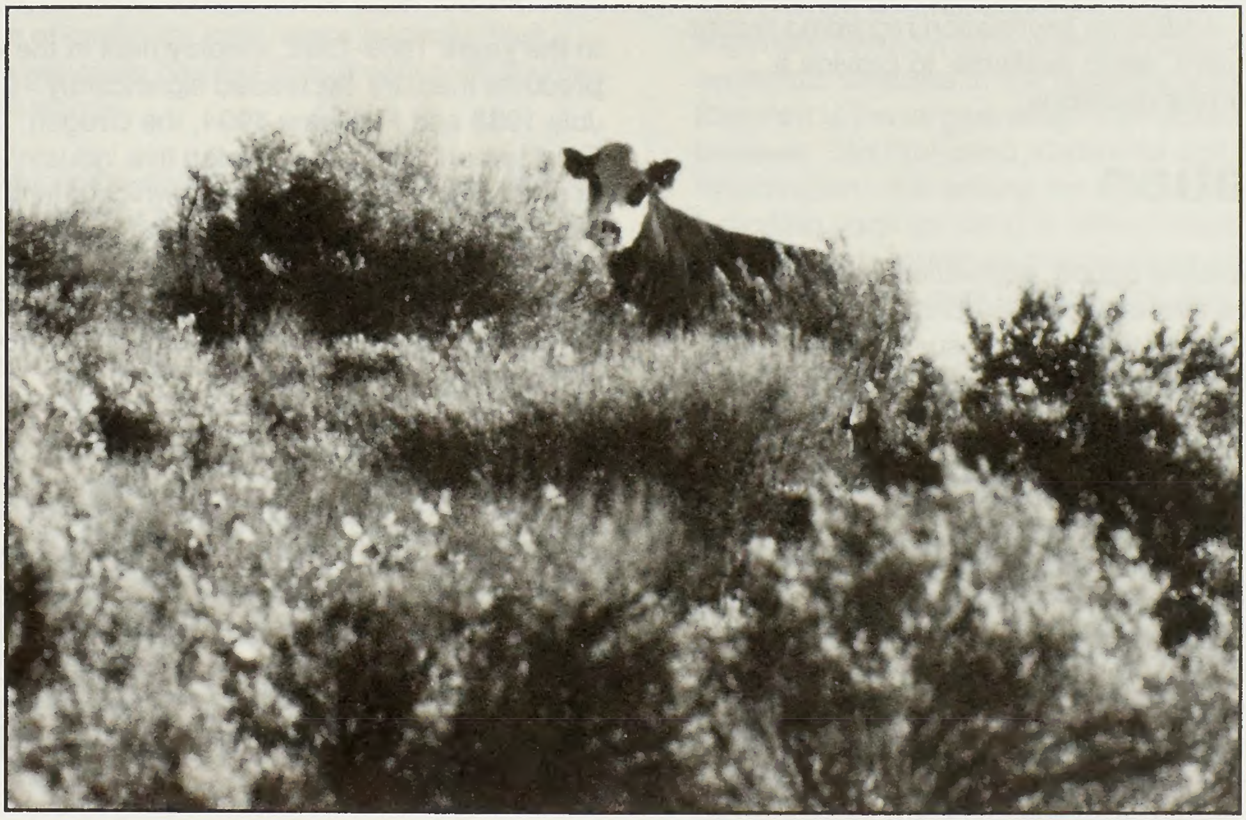
Table 3-55. Salable Mineral Potential

Management Categories	Potential (in acres) Low or Unknown	Moderate	High	Total
Closed-Nondiscretionary	400	100	100	600
Closed-Discretionary	5,700	1,000	400	7,100
Open-Standard Requirements	253,100	47,500	15,800	316,400
Open-With Additional Restrictions	4,400	800	300	5,500

Livestock Grazing

Livestock grazing is a minor activity occurring on the district. Six long-term (10-year) and one short-term (one-year) leases have been issued by the district authorizing 270 Animal Unit Months (AUMs) of use on 439 acres of BLM-administered land.

Of the leases, four are for less than 10 acres each, primarily authorizing the grazing of meadows adjacent to private land. Two leases in the New River area authorize the grazing of subirrigated floodplains during the dry summer season.



Socioeconomic Conditions

The planning area is located on Oregon's southern coast and includes lands in Coos, Curry, Douglas, and Lane counties. For the purpose of socioeconomic description, the planning area has been equated to Coos and Curry counties. Information regarding population, employment, and personal income was examined to determine the basic structure and scope of the regional economy. In most cases only a summary is presented for each county.

A 1984-1988 baseline was selected to represent average economic conditions in the region. The selected baseline encompasses a period of national growth that followed the recession of the early 1980s. The Coos-Curry region, like many non-metropolitan areas of the state, was slower to show economic growth after the recession. This is one indicator of the region's limited economic diversity that persists. Additional information regarding recent trends is included, when available, to provide a context for current decisions.

Population

During the baseline period, population in Coos and Curry counties averaged 58,990 and 17,300, respectively. Since the 1980 census, the two counties have shown varying population trends. In Coos County the 1990 Census, as reported by Portland State University's Center for Population Research and Census (CPRC), was 60,273 with 40 percent living in unincorporated areas. Coos County experienced population losses in the early part of the decade with increases beginning in 1988. Even with recent increases, the estimated 1992 population of 62,100 is below the 1980 census of 64,047. Net migration out of the county (1980 to 1992) was 4,711 (CPRC 1991,1993). Decreasing population trends often follow decreases in employment opportunities. Employment trends, discussed in the following section, demonstrate reduced employment opportunities within the county.

In Curry County, the 1990 census as reported by CPRC totaled 19,327, with 64 percent living in unincorporated areas. Since 1980, population decreases in 1982, 1984, and 1985 were more than offset by increases in other years. The estimated 1992 population of 21,400 is significantly greater than the 1980 census of 16,992. Net migration into the county (1980 to 1992) was 4,179.

Demographic data suggests that many of the new residents in the planning area are retired persons. For example, both Coos and Curry counties have high percentages of the population over 65 years of age (17.6 percent and 23.2 percent respectively). Both percentages exceed the statewide percentage of 14 percent, with the Curry County figure being almost double the state average. (CPRC 1993).

Employment

Traditionally, the south coast region of Oregon has been economically dependent upon natural resources with timber, fisheries, and recently tourism providing significant employment in the region. The wood products sector (including paper) is the largest manufacturing employer in the region. An average of 3,230 persons in Coos County and 960 persons in Curry County were employed each year by this sector during the baseline period.

In the years 1989-1992, employment in the wood products industry decreased significantly. Between July 1988 and February 1994, the Oregon Employment Division recorded five industry cutbacks or plant closures in the district, which affected 1,000 jobs. This includes 305 jobs in the Douglas County portion of the district. Closures in Coos and Curry counties impacted 695 jobs representing 16.6 percent of the 1984-1988 average wood products employment in Coos and Curry counties.

Trade generated an average employment of 4,316 in Coos County and 1,140 in Curry County during the baseline period. Employment in the government sectors averaged 4,280 in Coos County and 1,054 in Curry County. While employment in the trade, service, government, and construction sectors increased during the baseline period, the recent employment growth in all sectors has been slow. (State of Oregon, Oregon Employment Division, various years).

Unemployment rates in the region have generally decreased since 1984, while total employment growth has been slow. These two factors suggest a combination of out-migration from the area and frustrated workers leaving the labor force. Although unemployment trends in the two counties had similarities, there were some distinct differences. The unemployment in Coos County peaked at 14.9 percent during 1984, but then steadily declined reaching a low of 8.2 percent in 1987. By contrast, the unemployment rate in Curry County had a wider gap, with a high of 16.3 percent in 1982 and a low of 5.9 percent in 1988. Unemployment started increasing in Coos County in 1988, and in Curry County in 1989. (State of Oregon, Oregon Employment Division, various years).

Employment information by sector for various years in Coos and Curry counties is displayed in Tables 3-56 and 3-57. Similar data is displayed for the state in Table 3-58.

Personal Income

Personal income statistics, which track both wage and non-wage income sources, are a reliable indicator of the wealth of a particular area. Non-wage income sources include transfer payments (unearned income in the form of direct payments from federal and state sources including unemployment compensation and aid to low income families), interest, dividends, and rent. In Coos and Curry counties where a large number of residents are retired, consideration of these other income sources is of particular importance because their income is generally derived from a variety of sources other than wages.

Per capita income during the 1984-1988 baseline period averaged $12,178 in Coos County, and $12,838 in Curry County. The statewide per capita income average was $13,598, slightly higher than in the planning area (U.S. Dept. of Commerce, Bureau of Economic Analysis, 1993). In recent years, this gap has generally not changed in Coos County, but has been narrowing in Curry County.

Personal income information for Coos and Curry counties and the state are displayed in Tables 3-59, 3-60, and 3-61. Also displayed is average income for the baseline period, as well as annual data for various years.

Local Resources

According to studies done by the state of Oregon, several communities in the planning area have a high degree of timber dependence (Bowling et al. 1990). These include Brookings, Gold Beach, Harbor, and Port Orford in the southern part of the planning area and Bandon, Coos Bay, Coquille, North Bend, Norway, Myrtle Point, Powers, and Reedsport in the northern part. Further, as part of its coordinated Timber Response Program, the state has identified Gold Beach and all of Coos County for additional state assistance in coping with decreasing timber employment. (Oregon Economic Development Department 1993).

Recent declines in the timber harvest in both the region and the local planning area have focused efforts on economic diversification. The issue of displaced workers, many from the timber industry, is being addressed locally through cooperative efforts between the Oregon State Employment Office, South Coast Business, and Southwestern Oregon Community College (SWOCC). SWOCC is now into its third year of a tuition-waiver program for certified displaced workers. Enrollment at any one time in the program has reached a high of 100 students. Funding for cross training has also been available to residents in the planning area through the Trade Rehabilitation Act of 1991.

The Bay Area Hospital, a major employer in the Coos Bay/North Bend area with a staff of over 700 people, has also extended educational opportunities to residents in the planning area.

The Oregon International Port of Coos Bay is an important consideration in both the current and future economic structure of the planning area. The Coos Bay Port is the largest deep-draft ocean port between San Francisco, California and Puget Sound, Washington. It is among the top two forest products exporting ports on the U.S. West Coast, and has several cargo terminals that facilitate shipping. (Oregon International Port of Coos Bay 1991).

Other transportation facilities in the planning area include Southern Pacific Rail, major truck connections, a commercial airport offering both passenger and cargo services, and an improved state arterial road system which is beneficial to residents, businesses, and tourism. The road system includes Highway 101 paralleling the Pacific Ocean, and Highways 42 and 38 which connect the communities within the planning area and along Highway 101 to the Interstate-5 freeway corridor and major metropolitan areas.

Several local initiatives are underway to diversify the planning area's economy. Tourism in general is being emphasized. Specific efforts include development of an industrial park on the North Spit of Coos Bay. Another local effort is a nickel ore unloading and drying facility complet*ed* in 1992 in the Coos Bay area; this project will have a $36 million investment in facilities and will create additional local employment. The nickel ore project will involve the import and trucking of one million tons of ore per

Table 3-56. Employment Information by Sector for Various Years in Coos County

	1970	1980	Average 1984-88	1989	1990	1991	1992
Civilian Labor Force	22,050	29,410	27,492	27,420	27,290	27,180	27,660
Unemployment	1,860	4,060	3,078	2,700	2,440	2,470	3,130
Total Wage and Salary Emp.	17,390	20,880	18,878	19,340	19,560	19,380	19,650
Total Manufacturing	6,580	5,130	4,510	3,780	3,680	3,240	3,180
Lumber & Wood Products	5,440	3,930	3,236	2,540	2,370	1,880	1,810
Other Manufacturing	1,140	1,200	1,274	1,240	1,310	1,360	1,370
Total Non-Manufacturing	10,810	15,750	14,372	15,560	15,880	16,140	16,480
Const. & Mining	460	710	476	600	690	720	720
Trans., Comm. & Utilities	1,560	1,740	1,382	1,410	1,430	1,450	1,400
Trade	2,890	4,350	4,316	4,810	4,890	5,000	5,100
Finance, Ins. & Real Est.	740	940	786	770	810	830	860
Services & Misc.	2,190	3,090	3,132	3,480	3,390	3,370	3,540
Government	2,970	4,920	4,280	4,490	4,680	4,750	4,870

Source: Oregon Employment Division

Table 3-57. Employment Information by Sector for Various Years in Curry County

	1970	1980	Average 1984-88	1989	1990	1991	1992
Civilian Labor Force	5,310	7,130	8,250	9,710	9,760	9,740	9,420
Unemployment	370	900	746	620	570	590	800
Total Wage and Salary Emp.	3,580	4,670	4,676	5,650	5,690	5,650	5,430
Total Manufacturing	1,470	1,130	1,100	1,200	1,020	970	860
Lumber & Wood Products	1,310	890	960	930	730	680	650
Other Manufacturing	160	240	140	270	290	290	210
Total Non-Manufacturing	2,110	3,540	3,574	4,460	4,670	4,680	4,570
Const. & Mining	100	200	222	300	310	340	290
Trans., Comm. & Utilities	190	190	180	240	250	230	230
Trade	550	1,030	1,140	1,490	1,530	1,540	1,500
Finance, Ins. & Real Est.	130	220	226	290	290	280	270
Services & Misc.	280	590	754	890	950	980	990
Government	860	1,310	1,054	1,250	1,340	1,310	1,290

Source: Oregon Employment Division

Table 3-58. Employment Information by Sector for Various Years for the State of Oregon

	1970	1980	Average 1984-88	1989	1990	1991	1992
Civilian Labor Force	864,500	1,295,000	1,362,400	1,475,000	1,491,000	1,508,000	1,537,000
Unemployment	61,700	107,000	104,800	84,000	82,000	90,000	115,000
Total Wage and Salary Emp	709,200	1,044,600	1,068,680	1,209,400	1,251,900	1,250,800	1,270,900
Total Manufacturing	172,300	215,100	203,240	218,400	220,300	211,700	207,400
Lumber & Wood Products	76,200	79,900	75,060	76,400	73,200	65,800	63,300
Other Manufacturing	96,100	135,200	128,180	142,000	147,100	145,900	144,100
Total Non-Manufacturing	536,900	829,500	865,440	991,000	1,031,600	1,039,000	1,063,500
Const. & Mining	30,800	48,800	35,800	47,600	54,000	53,000	51,100
Trans., Comm. & Util.	48,700	60,500	58,040	63,100	64,500	65,200	65,500
Trade	162,000	255,600	269,680	305,900	313,100	314,300	320,200
Finance,Ins.& Real Est.	36,000	70,000	69,360	75,900	80,300	83,200	86,000
Services & Misc.	112,700	191,400	231,180	282,900	296,200	296,900	309,900
Government	146,700	203,200	201,360	215,600	223,500	226,400	230,900

Source: Oregon Employment Division

Table 3-59. Local Area Personal Income by Industry, Coos County (thousands of dollars)

	1970	1980	Average 1984-88	1989	1990	1991
Total personal income	199,381	548,253	722,443	846,442	898,174	931,388
Population (thousands)	56.9	63.9	59.4	59.6	60.5	60.9
Per capita personal income (dollars)	3,503	8,577	12,178	14,192	14,845	15,296
Farm	3,436	7,970	15,880	31,416	28,660	26,708
Nonfarm	157,736	379,267	453,681	503,193	533,859	542,483
Ag. serv., for., fish., and other	2,887	9,080	19,190	22,183	23,543	23,228
Mining	159	1,608	1,046	1,329	1,210	1,366
Construction	7,601	22,228	17,673	22,296	25,396	27,075
Manufacturing	62,284	112,385	122,899	111,101	110,674	96,723
Nondurable goods	5,908	14,147	16,660	19,779	21,749	23,226
Paper and allied products	(D)	(D)	(D)	(D)	(D)	(D)
Durable goods	56,376	98,238	106,239	91,322	88,925	73,497
Lumber and wood products	55,150	92,719	97,669	80,023	76,795	60,945
Transportation and public utilities	17,408	39,930	46,508	52,870	54,133	56,660
Wholesale trade	3,824	12,929	14,514	19,195	20,173	19,971
Retail trade	18,147	43,601	55,669	66,114	72,712	77,950
Finance, insurance, and real estate	3,963	12,022	11,792	12,353	14,572	14,162
Services	17,830	54,578	73,364	90,020	97,627	102,221
Government and government enterprises	23,633	70,906	91,026	105,732	113,819	123,127
Federal, civilian	3,779	10,720	12,597	14,381	15,641	16,756
Military	2,131	5,793	9,236	8,717	8,945	9,324
State and local	17,723	54,393	69,193	82,634	89,233	97,047

Abbreviation used in table:
D = Not disclosed for confidentiality

Source: Bureau of Economic Analysis, Regional Economic Information System, 1993

Table 3-60. Local Area Personal Income by Industry, Curry County (thousands of dollars)

	1970	1980	Average 1984-88	1989	1990	1991
Total personal income	41,692	151,709	217,248	275,069	294,041	307,417
Population (thousands)	13.1	17.1	16.9	18.7	19.5	19.6
Per capita personal income (dollars)	3,183	8,881	12,838	14,685	15,045	15,645
Farm	1,656	4,450	6,183	10,924	10,332	11,244
Nonfarm	29,127	81,999	102,213	125,795	133,010	136,895
Ag. serv., for., fish., and other	622	3,158	4,274	4,476	5,550	5,093
Mining	73	575	169	243	110	66
Construction	1,198	5,285	8,472	10,095	11,124	12,406
Manufacturing	12,439	27,976	28,213	33,785	28,793	27,769
Nondurable goods	533	1,477	838	1,782	2,203	2,727
Paper and allied products	0	0	0	0	0	0
Durable goods	11,906	26,499	27,374	32,003	26,590	25,042
Lumber and wood products	11,755	25,702	26,577	30,009	24,272	23,370
Transportation and public utilities	1,458	3,832	5,964	7,122	7,495	7,634
Wholesale trade	314	730	648	922	1,162	1,068
Retail trade	3,656	10,884	15,675	21,680	24,735	26,472
Finance, insurance, and real estate	714	2,164	1,532	1,972	2,745	2,206
Services	3,295	10,240	17,312	20,306	22,902	24,253
Government and government enterprises	5,358	17,155	19,953	25,194	28,394	29,928
Federal, civilian	1,158	3,979	5,067	6,443	7,750	7,128
Military	261	800	1,246	1,435	1,492	1,436
State and local	3,939	12,376	13,640	17,316	19,152	21,364

Source: Bureau of Economic Analysis, Regional Economic Information System, 1993

Table 3-61. Local Area Personal Income by Industry, Oregon (thousands of dollars)

	1970	1980	Average 1984-88	1989	1990	1991
Total personal income	8,163,400	26,053,992	36,647,682	45,188,249	48,744,661	51,111,885
Population (thousands)	2100.4	2641.5	2693.3	2790.6	2861.0	2921.6
Per capita personal income (dollars)	3,887	9,863	13,598	16,193	17,038	17,495
Farm	235,598	474,419	558,796	887,987	902,618	875,029
Nonfarm	6,191,140	18,903,314	25,431,683	31,599,836	34,259,527	35,858,962
Ag. serv., for., fish., and other	45,970	153,099	279,316	354,802	406,179	413,179
Mining	15,256	101,468	48,332	44,598	54,463	62,441
Construction	409,967	1,373,943	1,297,393	1,783,668	2,063,099	2,114,244
Manufacturing	1,579,414	4,749,512	5,809,247	6,969,524	7,204,428	7,340,506
Nondurable goods	406,845	1,073,769	1,401,383	1,650,289	1,769,440	1,869,165
Paper and allied products	98,990	287,975	368,584	414,698	418,696	431,657
Durable goods	1,172,569	3,675,743	4,407,864	5,319,235	5,434,988	5,471,341
Lumber and wood products	641,124	1,684,758	1,962,060	2,182,055	2,087,623	1,962,324
Transportation and public utilities	546,832	1,538,631	2,048,669	2,394,109	2,535,167	2,698,171
Wholesale trade	440,505	1,436,555	1,823,268	2,333,046	2,527,784	2,626,699
Retail trade	795,358	2,235,839	3,044,078	3,668,902	3,950,646	4,190,681
Finance, insurance, and real estate	304,149	1,000,050	1,269,971	1,545,520	1,710,894	1,753,013
Services	944,887	3,328,738	5,519,321	7,324,212	8,175,474	8,612,905
Government and government enterprises	1,108,802	2,985,479	4,292,088	5,181,455	5,631,393	6,047,123
Federal, civilian	262,232	609,044	849,918	1,025,116	1,127,937	1,171,540
Military	35,662	67,919	116,768	128,780	136,391	140,620
State and local	810,908	2,308,516	3,325,402	4,027,559	4,367,065	4,734,963

Source: Bureau of Economic Analysis, Regional Economic Information System, 1993

year to a smelter in Riddle for additional processing. (Vogel, Oregon International Port of Coos Bay 1992).

Another project involving Coos Bay was completed in 1992. Hall-Buck Marine Incorporated completed a $3.5 million improvement project at the Central Dock to permit loading and shipment of 350 tons of partially refined copper ore to foreign markets. Loading operations have created between 15 and 30 new jobs in the local area. The ore is transported from Utah by rail to the loading facility, providing additional employment opportunities for railroad workers. (Brands, Central Docks 1993).

There is also an active public/private partnership attempting to obtain an industrial natural gas pipeline between the Willamette Valley or Roseburg areas and the Coos Bay/North Bend/Reedsport area. Development of this new energy source would further enhance new industrial operations to locate in the coastal area. (Rumbaugh, Oregon International Port of Coos Bay 1993).

Some diversification within the timber industry is occurring as well. For example, a hardwood mill (Diamond Wood Products) recently opened in the Coos Bay area. In its current phase, the mill is primarily processing hardwood chips but future development plans include a small sawmill to accommodate other operations with the potential for employing additional people. Another notable effort involves a Weyerhaeuser Mill in Coos Bay which is focusing on cutting dimensional lumber into metric units to facilitate foreign marketing.

In May 1993, the Georgia-Pacific Corporation announced plans to construct a new sawmill at their site in Eastside. This plant, scheduled to be in operation by 1994, would process approximately 90 MMBF of second-growth logs per year from company lands within the planning area. The facility would provide approximately 80 new jobs, with provisions to expand in future years.

Another significant business in the planning area is the recent construction of a Walmart department store in the Coos Bay area, which employs approximately 200 people.

Outlying rural areas play a vital role in the planning area's economy. The city of Coquille and the individual counties have been working with the Oregon Economic Development Department (OEDD) through the Community Initiatives Program (Coquille Citizen's Advisory Group for Economic Development 1991) and the Regional Strategies Program (State of Oregon, Oregon Economic Development Department, 1988) to identify specific actions.

The city of Coquille is actively seeking industrial or commercial developers for the former Georgia-Pacific mill site which the city purchased in 1993 (Wolf, Coquille City Manager 1993).

BLM's Economic Contribution

BLM-administered lands in western Oregon make significant contributions to local economies. Timber harvested from public lands supplies local mills. Harvest of special forest products provides specialty products for both commercial establishments and recreational activities. Commercial and sport fisheries depend upon fish reared in stream reaches managed by BLM. Tourists bring new dollars into local communities, and counties receive payments from BLM in accordance with a variety of laws. For planning purposes, an input-output model (BLMPACT) was developed to facilitate estimating the economic impacts of local BLM management on local and regional economies. Models were developed to represent each BLM district and western Oregon as a whole. (USDI, BLM, Oregon State Office, 1988).

Timber

The current forest management program for the planning area includes 243,300 acres of available forest land for intensive management, and 4,300 acres for restricted management. The average annual harvest from these lands between 1984-1988 totaled 261,137 MBF. (USDI, BLM, Coos Bay District, 1991). The average harvest for this period was above the allowable sale quantity due to harvest of previously sold sales remaining under contract. The sales remaining under contract included sales from the late 1970s and early 1980s which had been granted extensions of up to five years through the Federal Timber Contract Payment Modification Act of 1984.

BLM timber sales have been halted by court injunction since 1990. Through fiscal year 1993, harvest of BLM sales previously sold and remaining under contract have continued to provide jobs and income in the region. As of October 1, 1993, very little timber remains under contract, and no significant harvests are expected from BLM-administered lands for the duration of the injunctions.

During the baseline period, timber harvests from BLM-administered lands in the planning area supplied 35 percent of total harvest from all ownerships in Coos County, 6 percent in Curry County, and 9 percent in Douglas County. This represents 25 percent of all harvests within the planning area.

The average annual harvest from BLM-administered lands in the planning area is estimated to have contributed 1,500 jobs in the timber industry and $40.38 million in direct local personal income during the baseline period. Respending effects added 880 jobs in other sectors and $11.99 million in local personal income.

Special Forest Products

The BLM provides for public use of special forest products consistent with other land uses and resource allocations. Free use collection of mushrooms, huckleberries, elderberries and other products provides a unique and rewarding recreational opportunity for many individuals. Traditional, ceremonial, and subsistence uses are also met through free use collection.

In addition, negotiated and advertised sales provide significant receipts and contribute to local employment. In 1989, floral greenery sales within the Pacific Northwest were estimated to generate $128 million within the regional economy and employ 10,000 people. (Schlosser et al. 1992)

Tables 3-23 and 3-24 (see Special Forest Products in the Vegetation section) identify types of forest resources collected in the district and quantity collected for those items documented through permitting or sale. In western Oregon, the total BLM collections associated with the sale of special forest products totaled $2,355,000 between FY 1987 and FY 1991.

Tourism

Most BLM-administered lands are available to the general public for recreational use. Opportunities exist for various types of site-specific and dispersed recreational use. It is assumed that the total amount of spending on recreation by district residents is not directly influenced by the provision of recreation opportunities on BLM-administered lands. Instead, community economic impacts occur when visitors from outside the planning area make purchases in the local economy. These "new" dollars create jobs and enhance personal income.

Approximately 24 percent (302,300) of the recreational visits made annually to BLM-administered lands in the planning area represent visits by non-residents. This includes 4,300 non-resident hunters and 26,100 non-resident anglers. Non-consumptive uses attracted the most visitors, totaling 271,900 non-residents. Input-output analysis suggests that spending by these visitors generated 200 direct jobs and $2.02 million in local personal income. Respending effects added 100 jobs and $1.37 million in local personal income.

Increased emphasis by BLM for multiple resource management is promoting economic diversification. For example, the Dean Creek Elk Viewing Area east of Reedsport represents the BLM's support of recreation, tourism, and Watchable Wildlife facilities in the planning area. Another development expected to have a beneficial economic impact is the BLM's proposed Bal'diyaka interpretive center and recreation area including the Cape Arago Lighthouse at Gregory Point in the Coos Bay/North Bend area. Development and construction at Gregory Point is a joint effort among BLM, the Coos Confederated Tribes (Coos, Siuslaw, and Lower Umpqua), Oregon State Parks, and the U.S. Coast Guard. The budget for design and construction of the entire Gregory Point facility is estimated to be over $15 million. Permanent jobs at the center will also be created.

Additional facilities for boating, fishing, windsurfing, hiking, cultural resource interpretation, and beach activities are in the development stages at the North Spit, which is a popular recreating area near Coos Bay/North Bend, and also at New River located south of Bandon. Construction of the boat ramp for launching of recreational boats on the North Spit of Coos Bay was completed in 1993. Final construction of the parking and rest room facilities is planned for completion in 1994.

Fisheries

The Coos Bay BLM District manages 356 miles of stream suitable for spawning and rearing of anadromous fish species. Most of the salmon and coho spawned and reared in BLM-managed streams are caught offshore or on waters accessed through other ownerships. The value of the fisheries provided by BLM can be measured in terms of jobs and personal income generated by the commercial fishing industry, and by local expenditures by sport fishermen. Due to the mobility of anadromous fish, the economic benefits of fish spawned and reared in a specific location may accrue to regions outside the spawning region.

An estimated 125,000 pounds of chinook and coho salmon (round weight), or one percent of Oregon's total commercial landings of these anadromous species, can be attributed to BLM-administered lands in the planning area. An estimated 24,800 sport fishing visits can be attributed to the production of anadromous species in BLM-administered waters in the planning area. This estimate was developed independently of recreation estimates discussed previously. Input-output analysis estimates statewide employment of 20 direct jobs; also, $190,000 of direct personal income is dependent upon the fisheries resource in the district. Statewide respending effects added 10 jobs and $230,000 in personal income.

BLM Payments to County and State Governments

Besides generating income and employment throughout Oregon, activities on BLM-administered lands provide public revenues. State and local governments receive monies from timber harvest activities and as compensation for taxes foregone due to public ownership of lands. Changes in these payments impact local government employment and the services provided through affected agencies.

Fifty percent of the total revenue generated by timber sales on O&C lands is distributed to western Oregon counties by a formula based on the original assessed value of O&C lands within each county. Average payments to Coos and Curry counties (1984-1988) were $3,645,384 and $2,290,459 respectively (USDI, BLM, Oregon State Office, various years). Table 3-62 displays payments to the counties from 1989 to 1993. Unlike payments to counties from timber sales in the National Forests, which are required to fund schools and roads, the O&C payments enter directly into the county general fund and can be spent without restriction. In some counties, O&C payments represent a substantial portion of the general fund.

In recent years, annual legislation has provided for additional "safety net" payments to the counties. These payments guarantee revenue streams at levels slightly less than receipts in past years. These "safety net" payments have mitigated a large portion of the county revenue impacts of reduced BLM harvest under the court injunctions.

In 1919, Congress revoked title to 93,000 acres from the Coos Bay Wagon Road Company due to its failure to meet the stipulations of its land grant. Today the lands remaining from the original grant are located in Coos (59,914 acres) and Douglas (14,633 acres) counties. Local taxing districts where these lands are located receive Payments in Lieu of Taxes which are calculated on the same basis as property and severance taxes for privately-owned forest land. Table 3-63 displays the average (1984-1988) distribution of Coos Bay Wagon Road (CBWR) monies to taxing districts in Coos County. Approximately 75 percent of the payments are dependent upon the level of harvest.

The counties also receive Payments in Lieu of Taxes from the BLM for other federally managed lands (exclusive of O&C and CBWR lands). Compensation is paid for some Public Domain (PD) lands, National Forests, National Parks, Federal Water Projects, Army Corps of Engineers dredge disposal areas, some National Wildlife Refuges, and some military installations. These annual payments of 75 cents per acre, subject to a per capita ceiling, are reduced to a minimum of 10 cents per acre when other revenue sharing activities make equivalent payments. In western Oregon each county receives the minimum payment. During the baseline period, Coos and Curry counties received average payments totaling $6,752 and $57,610 respectively. (USDI, BLM, Oregon State Office, various years). Payments to Coos and Curry Counties in lieu of taxes since the baseline period are displayed in Table 3-64. These payments are not expected to change under any foreseeable BLM management strategy.

Approximately five percent of the revenues generated by BLM-administered PD lands are dispersed through the state to the counties, based on total land area of the county. The counties must use these monies to build roads and bridges. During the baseline period, the average annual payment to the state was $329,905. (USDI, BLM, Oregon State Office, various years).

The state of Oregon collects a harvest tax on every thousand board feet of timber harvested in the state to fund forest improvement and protection. This tax is used to fund several programs including forest research, the activities of the Forest Practices Act, and emergency fire control. Table 3-65 displays the tax rates during the baseline period and forward to the present biennium. The purchasers of BLM timber pay this tax.

The impacts of Ballot Measure 5 property tax limitation is independent of federal taxation, spending, revenue sharing, or land management. However, the measure is an important economic condition that is influencing county funding in

Table 3-62. O&C Payments to Coos and Curry Counties from 1989 to 1993 (dollars)

Year	Coos County [1]	Curry County
1989	7,285,785	3,921,045
1990	12,739,521	7,435,458
1991	4,529,782	2,521,766
1992	7,464,577	4,325,552
1993	5,172,240	2,868,406

[1] Includes CBWR Payments

Source: USDI, BLM Oregon State Office, various years.

western Oregon. In general, urbanized counties in western Oregon have reduced tax rates to comply with the laws. Most rural counties are at, or are approaching, the maximum permitted tax rates. For this reason, it is generally accepted that western Oregon counties will be unable to generate additional or substitute revenue through property tax rate increases if revenue from federal or other sources decline.

Community Stability

The previous sections detailed economic indicators for the planning area during the baseline period and presented some information on more recent trends. The national recession in years following the baseline period was felt locally. Slow employment growth statewide between 1989 and 1992 occurred in all sectors of Oregon's economy including electronics, wholesale and retail trade, manufacturing, and lumber and wood products. This has caused increasing unemployment rates. Of these industries, the lumber and wood products sector is the most vulnerable to impact by BLM management.

Federally-administered lands within the planning area include lands managed by the BLM, and the Siskiyou and Siuslaw National Forests. The Elliott State Forest is also within the planning area. Major industrial forest owners in the area include International Paper, Weyerhaeuser, Menasha, Moore Mill and Lumber, Georgia-Pacific Corporation, South Coast Lumber, Westbrook, and the John Hancock Company. Mills currently (1994) operating within the planning area include Roseburg Lumber in Coquille, CBX (Weyerhaeuser Export) in Coos Bay, Rogge Forest Products in Bandon, and South Coast Lumber in Brookings. Hardwood processing is being done at Quiet Valley Forest Products in Norway and Diamond Wood Products in Coos Bay. Paper mills in operation are International Paper in Gardiner and Weyerhaeuser on the North Spit of Coos Bay. In addition to these large operations, there are a number of small specialty mills that process cedar shakes and shingles, arrow shafts, and other specialty products.

Within the planning area, BLM historically supplied 25 percent of timber harvested from all ownerships. Historic harvest from other ownerships is as follows: private non-industrial forest land (4 percent), industrial forest land (47 percent), national forests (18 percent), State lands (5 percent), and other ownerships (less than 1 percent). The volume of timber sold from federally-administered lands, including BLM, in the planning area has been substantially lower than the historic levels of the baseline period. Harvest levels have also declined since the baseline period.

Accompanying these harvest reductions are several structural changes in the lumber and wood products sector, many of which are listed below:

- Decrease in labor intensity.
- Increase in use of small diameter logs.

Table 3-63. Coos Bay Wagon Road Payments Made to Local Taxing Districts (1984-1988)

Taxing District	Average Annual Severance Tax ($)	Average Annual Property Tax ($)	Average Annual Budget Levy ($)	Average CBWR Payment (% of Levy)
Coos County	27,802	10,607	3,304,101	1.16
Sumner RFPD [1]	430	0	30,229	1.42
Bay Area Hospital [2]	1,509	264	535,380	0.33
Coquille Valley Hospital	768	508	72,456	1.76
Port of Bandon	393	556	311,577	0.30
Port of Coos Bay	999	377	743,826	0.19
Port of Coquille	1,130	354	14,086	10.53
School District #8	24,284	17,820	2,622,151	1.61
School District #9	32,432	11,118	9,204,842	0.47
School District #41	192,135	52,384	2,449,579	9.98
SW. Ore. Comm. College	24,887	7,154	2,542,792	1.36
Coos County E.S.D.	14,426	6,823	2,068,391	1.03

[1] No property tax for any year and severance tax for 1984-1987 only.

[2] No levy submitted or property tax for 1987-1988.

Table 3-64. Payments to Coos and Curry Counties in Lieu of Taxes for 1989 to 1993 (dollars)

Year	Coos County	Curry County
1989	6,967	59,051
1990	6,967	59,048
1991	6,967	59,048
1992	6,993	59,080
1993	6,995	59,104

Source: USDI, BLM, Oregon State Office, various years.

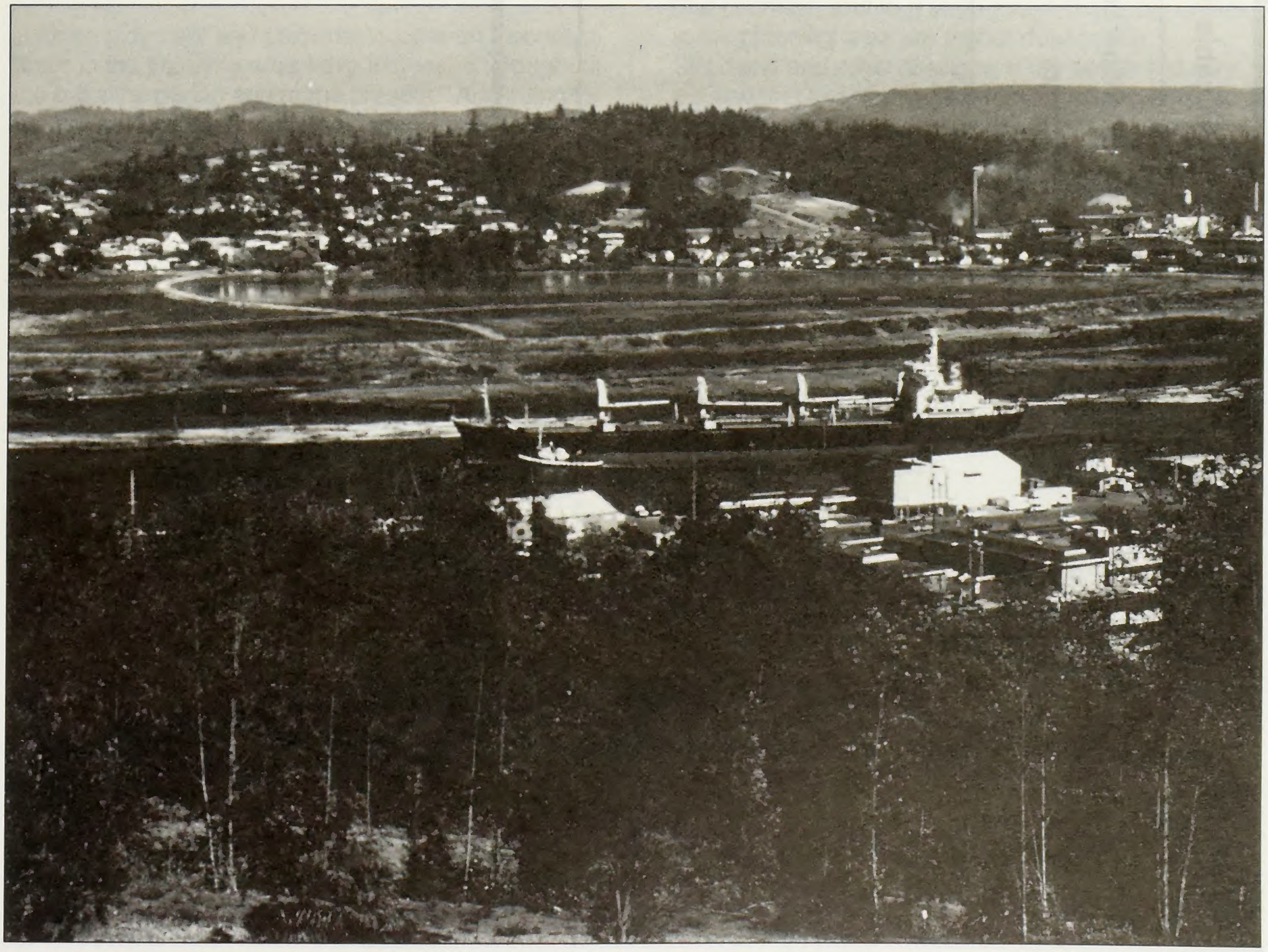


Table 3-65. Forest Products Harvest Tax (FPHT) Rates Applicable to BLM Timber Purchasers

($/Mbf Scribner Long Log)

Period	Forest Practices Act	Forest Research Lab	Emergency Fire Fund	Forest Resources Inst.	Industrial Fire Prevention	Total FPHT Rate
7/1/83-6/30/85	0.12	0.23	0.15	0.00	0.00	0.50
7/1/85-6/30/86	0.10	0.21	0.00	0.00	0.00	0.31
7/1-86-6/30/89	0.10	0.21	0.15	0.00	0.00	0.46
7/1/89-6/30/91	0.16	0.21	0.30	0.00	0.00	0.67
7/1/91-6/30/92	0.39	0.30	0.50	0.31	0.14	1.64
7/1/92-6/30/93	0.40	0.30	0.66	0.31	0.13	1.80

Source: Oregon Department of Revenue, Schaek, R. pers. comm. 1991 and Gilchrist, G. pers. comm. 1993.

- Increase in competition and specialization.

- Expansion of international markets for wood products.

- Increased use of substitute building materials.

- Expanded use of oriented strand board.

- Increased production and use of laminates and engineered wood products.

- Increased use of hardwoods.

These structural changes that accompanied the lower timber harvest levels serve as indicators of the area's timber dependence. When measuring the percentage of employment in the lumber and wood products sector against the total employment in the region, timber dependence has been decreasing. Comparing personal income proportionally, lumber and wood products dependence has likewise been decreasing.

Both employment and personal income on a county basis in the planning area have increased throughout the baseline period and to the present. According to demographic data, the planning area's population, and subsequently its sources of employment and personal income, are becoming more concentrated in the incorporated areas of North Bend, Coos Bay, and Brookings. Population in the unincorporated areas of the district has been decreasing, possibly implying that personal income and employment in the rural areas are not increasing, but may in fact be decreasing. Because rural areas in the planning area typically have only one or two large manufacturing employers, usually timber-related, employment options in these communities are severely limited.

County dependence on BLM and other sources of federal timber revenue was assessed in *Social Impacts of Alternative Timber Harvest Reductions on Federal Lands in O&C Counties* (Lee et al. 1991). According to that report, the Fiscal Year 1990-91 O&C payments in Coos County represented approximately 19 percent of the county's total county budget and 35 percent of the county's general fund. In Curry County, the Fiscal Year 1990-91 O&C payments represented approximately 11 percent of the total county budget, and approximately 44 percent of the general fund. Further, combined federal (BLM & USFS) timber revenues were approximately 22 percent of the total county budget in Coos County, and 27 percent in Curry County.

The counties, and to a large extent the communities, in the planning area are timber dependent. Structural and other changes in the timber industry are causing substantial economic and social impacts. The social impacts associated with these changes include unemployment, loss of income, increased needs for social services, and out-migration from particularly distressed areas.

Rural Interface Areas

County governments have planned and zoned some private forest lands intermingled with BLM-administered lands as "rural residential" or "farm/forest" (or similar titles). In the rural residential zones, minimum allowable lot sizes range from 1 to 5 acres. In the farm/forest zones, minimum allowable lot sizes range from 6 to 20 acres. Single-family dwellings are allowed in the rural residential zones and with conditions or restrictions often applied in the farm/forest zones. Depending upon the quality of forest resources and levels of existing development in the 6-to 20-acre zones, zoning ordinances may:

- Restrict nonresource uses (e.g., prohibit homes unless necessary for management of forest resources).
- Allow nonresource uses with conditions (e.g., permit a home placed so it does not interfere with adjacent resource uses), or
- Allow a mixture of resource and nonresource uses.

These provisions are intended to reduce the possibility of concerns between residential uses and forest resource management activities.

In some situations within the district, residential uses in both rural residential and farm/forest zones have created concerns with intensive forest management activities on adjacent or nearby BLM-administered lands. Due to adverse effects on both interests, these concerns need to be addressed in BLM land use planning. To accomplish this, the areas where rural residential and/or farm/forest zoning occur near BLM-administered lands have been mapped (see Map 3-12) and labeled rural interface areas (RIAs).

RIAs include areas of private and BLM-administered land within 0.5-mile of the interface line. The 0.5-mile distance was selected as a probable zone of influence. The analysis of impacts in Chapter 4 will also examine a 0.25-mile zone of influence within the RIAs. Although problems have occurred where lots are larger than 20 acres, these larger-lot areas will not be analyzed due to limited inventory data.

The amount of BLM-administered land within the zones of influence is summarized in Tables 3-66 and 3-67. Total BLM-administered land in RIAs is 2,058 acres within the 0.25-mile zones of influence and 6,693 acres within the 0.5-mile zones of influence.

RIAs are found throughout the lower elevations of the district with most located near population centers, along county roads, and in "finger" valleys extending into the Coast Range. Many of these private land areas in RIAs are highly desirable for residential use which is of concern to BLM for two major reasons:

- Homes and lot sizes in both zones impede economic and efficient management of BLM-administered forest lands.
- Some RIA residents, including those in the 6- to 20-acre zones, object to forest management activities on adjacent lands and take actions to stop or change the activity.

BLM's rural neighbors generally accept adjacent or nearby forest management activities. However, the district has experienced some resource management concerns relative to such activities or situations as the following:

- Location of a house too close to a property line to allow safe and efficient timber harvest and reforestation operations on adjacent BLM lands.
- Taking of domestic water from a stream temporarily affected by road building or other forest management operations.
- Objection by a resident to a large clearcut on a steep slope within immediate view of the home.
- Possible health and safety concerns due to proposed slash burning or herbicide use in a nearby area.
- Denial of access across private property which interfered with management of adjacent BLM-administered land.
- Safety hazards incidental to traffic.
- Grazing trespass.

The number of such concerns will undoubtedly increase as significantly more private land adjoining BLM-administered land is planned and zoned to allow additional residential use. Concerns presented early in project planning can be given full consideration in developing design features and mitigation measures to reduce potential impacts. Concerns voiced late in the planning process, however, cause considerable delay in project implementation, often necessitating the need for further and costly analysis and coordination. In the future, the incidence of such costly implementation delays is expected to increase along with the trend for rural residential development.

Table 3-66. BLM Acres in Rural Interface Areas - 0.25-Mile Analysis Areas

County	5-Acre Maximum Lots [1]	6-to 20-Acre Lots
Lane	0	0
Douglas	463	0
Coos	1,466	43
Curry	86	0
Total	**2,015**	**43**

Source: Automated Resources Data Map "CTZ".

Includes Urban Growth Boundaries

Table 3-67. BLM Acres in Rural Interface Areas - 0.5-Mile Analysis Areas

County	5-Acre Maximum Lots [1]	6-to 20-Acre Lots
Lane	0	0
Douglas	1,440	0
Coos	4,772	123
Curry	358	0
Total	**6,570**	**123**

[1] Includes Urban Growth Boundaries

Source: Automated Resources Data Map "CTZ".

Fire

Fire and other agents of disturbance—such as wind, insects, and diseases—have greatly influenced the development of Pacific Northwest forests (Agee 1990, 1991; Kauffman 1990; USDI 1992). Fine-scale disturbances, generally by insects or diseases, have caused deaths of single trees or small groups of trees. This has resulted in small patches of early-successional vegetation embedded in a larger portion of older forest. Coarse-scale disturbances, such as fire and wind, have resulted in more extensive areas of early-seral vegetation. Many native forest organisms have adapted to these cycles and scales of disturbance and regrowth. Forest ecosystems are dynamic, changing with or without active management.

Fire, the major natural agent of disturbance within the planning area, has both direct and indirect effects on the forest environment. The distributions, abundance, and dominance of the major plant communities are strongly affected by wildfires. The degree of effects depends on individual forest stands and plant community conditions and composition. Most of the current late-successional and old-growth stands developed from natural regeneration following wildfire events that occurred during the last 200 to 600 years. While some of these fires covered large areas—frequently many thousands of acres—they burned in patches of variable intensity and severity.

The patchy fires left many forest areas unburned or lightly burned, with an abundance of large dead trees and lesser amounts of scattered live trees, as individuals and in patches. This natural burn pattern is the basis for silvicultural methods such as retention of green trees, some as individuals and others in patches. Natural disturbance patterns throughout the planning area have a long history and were sometimes catastrophic. In some areas, disturbances were frequent and of low magnitude, maintaining open forest stands.

The combination and interaction of fire frequency, intensity, and extent that occur in an ecosystem is known as a fire regime (Agee 1981). Natural fire regimes vary widely between and across landscapes, from infrequent (hundreds of years) stand replacement fires, to very frequent (several years) low-intensity surface fires that had little effect on the canopy trees. While recognizing these variances, some generalizations can be made to characterize fire's role in natural ecosystem processes. These descriptions are based on knowledge of pre-European settlement fire regimes derived from historical accounts, early forest management inventories, and various fire imprints on forest stands (e.g., stand ages and other tree ring data).

Fire regimes can be described by the characteristics of either the disturbance itself (Heinselman 1981) or the vegetation (Davis et al. 1980), or by fire effects or severity (Agee 1990). The fire severity system, defined in terms of fire effects on dominant tree species, works well for application to habitat.

A primary characteristic of a high severity fire is one that topkills most of a stand's vegetation (70 to 80 percent or more of the basal area); a moderate severity fire topkills 20 to 70 percent; and a low severity fire topkills less than 20 percent. In a silvicultural sense, fire tends to thin from below, first taking smaller trees and/or those less fire-resistant (thin-barked, for example). Regardless of an area's typical fire severity, other severity levels are likely to occur there as well.

Moderate fire regimes are the most complex regimes due to their mix of expected fire severities. Low and high fire severity regimes are generally more predictable. Some management actions occurring over decades (such as successful fire protection) can change fire regimes from low or moderate severity, to moderate or high severity. This occurs primarily by changing the periodicity of fire and the amount of fuel accumulation that may occur in the absence of fire, particularly in the drier climates.

Over the long-term, fire regime is largely dependent on climate and weather patterns. Another factor that influences fire characteristics is the available fuel from past forest management practices, including the use of prescribed fire and the effectiveness of wildfire suppression (i.e., wildfire exclusion). Smoke emissions from wildfires are also influenced by stand history and weather conditions.

Interruption of natural fire regimes directly affects ecosystem species composition and sometimes species persistence. The near exclusion of natural, low-to-moderate intensity wildfires has resulted in a proliferation of fire-intolerant and shade-tolerant species (e.g., western hemlock, true fir species, and hardwoods). These species are replacing Douglas-fir forest types. Fire exclusion is also affecting long-term soil productivity, stand structure and function, forest health, and biological diversity. When underburning is not done, biological diversity is diminished by the loss of many native plant species and some plant communities. The mortality of trees due to insects and disease makes forests more susceptible to high-intensity, stand-replacing fires.

Many natural disturbances do not result in complete mortality of stands. For example, recent fires in the western Oregon Cascades killed 25 to 50 percent of trees within the areas burned, leaving 50 to 75 percent of the stands intact (USDA FS 1988, 1989, 1992b). Surviving trees are important elements of the new stand, providing structural diversity and a potential source of additional large snags for the developing stand. Trees injured by disturbance are also important for their potential to develop cavities and deformed crowns/limbs that create habitat components for a variety of wildlife species.

Historically, landscapes in moist portions of some river basins periodically contained large areas of relatively unbroken forest cover due to large fires and relatively long fire return levels, often over 500 years. An example is in the moist Douglas-fir forests of Oregon's Coast Range where fire return levels are long (Fahnestock and Agee 1983). On the coast, this may be due to much larger than average events in the past as a result of short-term but extreme climate changes (USDI 1992). Even in the moist climates, fire has been an important ecosystem process in particular microclimates, such as on long, dry southwest-oriented slopes.

Reburn patterns at the southern Washington Yacolt burn of 1902 (Gray 1990) and on the Tillamook fire of 1933 at 6-year intervals (1939, 1945, 1951) (Pyne 1982) are evidence these landscapes may reburn. High surface fire potential during early succession in Douglas-fir forest was identified as a "vicious cycle" of positive feedback, encouraging rhizomatous bracken fern (*Pteridium aquilinum*) (Isaac 1940); this pattern was quantified by Agee and Huff (1987). Given sufficient sources for re-ignition (e.g., the original Yacolt and Tillamook burns and all reburns thought to have been human-ignited), the reburn hypothesis is likely to be true in certain areas. It is not clear, however, whether reburns were a common event prior to European settlement in the moist portion of the Douglas-fir region. After crown closure, potential surface fire behavior declines and then gradually increases in the old-growth seral stage (Agee and Huff 1987).

The warmer, drier landscapes had more frequent, but less intense fires typically covering tens to hundreds of acres. Fire suppression and timber harvest in the drier landscapes have interrupted the cycle of frequent and low intensity fires. This has likewise decreased the abundance of some types of old growth, such as Douglas-fir, that are dependent on these types of fires. Other types of late-successional forest that are less fire resistant or are less desirable for harvest have become more widely distributed. In these areas, the potential for stand-replacement wildfires has increased, along with the risk to the stability of current stands being reserved for late-successional species.

Disturbance is an important process within natural late-successional forest ecosystems, but humans have altered disturbance regimes. Prior to fire suppression, the history of forest fires in the district indicates relatively infrequent but very large fires, especially in the 1800s and 1900s. As a result, many of the remaining natural forests consist of a mosaic of mature stands and remnant patches of old-growth trees.

Fire suppression has significantly increased accumulated fuels within some forests, particularly in the eastern Cascades and in southwestern Oregon, including portions of the Coos Bay District (Agee 1990, Deeming 1990, Kauffman 1990). As a result of fire suppression, some forests have become quite dense and multistoried, primarily from the invasion of shade-tolerant species (Tappeiner et al. 1992). At the same time, these forests may have become much more vulnerable to insects and diseases (Mitchell 1990; Mutch et al. 1993; Wickman 1992). Total protection may have been viable short-term strategy in 1910, but it is not viable in the 1990s.

At a landscape scale and over long periods, stand-replacing wildfires have an important role in resetting successional processes and developing new areas of late-successional forests to replace those lost through succession or disturbance. For many years, the pattern of stand replacement fire was a model for westside Douglas-fir forests. Recent studies, particularly in the Oregon Cascades in drier western hemlock plant associations, suggest a higher fire frequency and different ecological role for fire in mesic-to-dry Douglas-fir forest. Morrison and Swanson (1990) suggest a natural fire rotation of 95 to 145 years during the last five centuries; they also illustrate, on fire intensity maps, the patchiness of at least some of these fires. A similar fire regime was noted by Means (1982) on dry Douglas-fir sites in the western Oregon Cascades. Using conservative methods that did not recognize underburns and had no resulting regeneration or substantial fire-scarring of trees, Teensma (1987) estimated a natural fire rotation of 100 years during the last five centuries. If fires of moderate severity are removed from the analysis, a stand-replacement mean fire return interval is 130 to 150 years, suggesting that while intense fires are a significant part of the natural fire regime in this area, fires of lower severity also occur. Other stands of 500 years age or older exist without much evidence of recurrent fire.

In general, fire reduces understory competition, increases light, provides nitrogen, and stimulates germination of some fire-adapted plant species. Historically, fire has maintained some canopy gaps that provide needed habitat for some plant species. Underburning may improve habitat for some fire-adapted plant/animal species. Some species are well adapted to periodic burning, some to the point their persistence is dependent upon it. Site-specific treatments are more appropriate than broader scale treatments because some species with limited distributions are fire intolerant. Further studies about fire's role in the life history of some species is warranted, particularly where their persistence is dependent.

The recent historical fire history of the Coos Bay District is displayed in Table 3-68.

One objective of the district's ecosystem analysis and management is to identify natural disturbance regimes and to manage the landscape within that context. The role of fire management in maintaining ecosystems within the planning area is well recognized. Fire management activities include wildfire suppression, wildfire hazard reduction, and prescribed fire applications. Fire is used or suppressed to achieve ecosystem management objectives at the landscape level.

Table 3-68. Number and Size of Fires on BLM-Administered Lands in the Coos Bay District by Size Class (1984 to 1993)

Size Class (acres)	Number of Fires	Number of Acres
0.00 to 0.25	22	3.16
0.26 to 9.99	44	198.90
10.0 to 99.99	17	368.50
100.0 to 299.99	2	296.00
300.0 to 999.99	0	0.00
Greater than 1000	0	0.00

Chapter 4
Environmental Consequences

Summary of Major Changes

General

- The major focus of this chapter is analysis of effects associated with the Proposed Resource Management Plan (PRMP). Analysis of impacts associated with the Preferred Alternative as displayed in the draft Resource Management Plan has been deleted.

- References include analysis conducted by the Forest Ecosystem Management Assessment Team (FEMAT) for the *Supplemental Environmental Impact Statement (SEIS) on Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl.*

- The land base has increased by approximately 400 acres as a result of acquisitions. Where acres are presented, the increase is shown only under the Proposed Resource Management Plan.

- Tables have been updated as noted.

Air Quality

- This section has been rewritten to incorporate relevant discussions in the SEIS.

Water Resources

- The Watershed Condition Index analysis has been dropped. The watershed analysis in the SEIS is incorporated by reference.

Biological Diversity and Ecological Health

- A discussion on impacts to ecological health has been added.

Vegetation

- A discussion on Port-Orford-cedar has been added.

- A section addressing Special Forest Products has been added.

Wildlife

- The discussion of impacts to neotropical migrant birds has been expanded.

Fish

- The long-term condition analysis has been dropped in favor of the analysis in the SEIS.

Special Status and SEIS Special Attention Species

- The SEIS analysis of species closely associated with late-successional forests has been incorporated and referred to as SEIS special attention species.

- The effects on individual species has been expanded.

- The analysis of 50-11-40 dispersal habitat criteria for the northern spotted owl has been dropped.

- Use of the McKelvey model for assessing the effects on the northern spotted owl has been dropped in favor of the SEIS analysis.

- The discussion on marbled murrelets has been expanded.

Timber Resources

- The term Probable Sale Quantity (PSQ) is used in place of the term Allowable Sale Quantity (ASQ).

- The Sensitivity Analysis discussion has been modified.

- The discussion on green tree retention requirements has been expanded.

- A discussion on adjustments of Riparian Reserve has been added.

- A discussion on Protection Buffers, Survey and Manage Requirements, and Protection of Bat Roost Sites has been added.

- The timber supply analysis has been updated.

- The discussion on forest health has been moved to the Biological Diversity section.

Socioeconomic Conditions

- Alternatives No Action and A through E have been re-analyzed within the context of changed Forest Service management direction specified in the SEIS Record of Decision. The analysis has drawn heavily upon the SEIS and decisions in the SEIS ROD to estimate what future actions are likely to occur on Forest Service lands and to enhance the discussion of cumulative impacts.

- A discussion on the demand for special forest products has been added.
- A discussion on global impacts has been added.
- The discussion on social impacts has been expanded.

Rural Interface Areas

- A discussion on the effects of helicopter logging has been added.

Effects on Wildfire

- This is a new section.

Consistency With Other Agency Plans and Programs

- This section addresses the Proposed Resource Management Plan only. Consistency with the alternatives was addressed in the draft.

Introduction

This chapter defines the environmental consequences (impacts or effects) of implementing the alternatives described in Chapter 2 considering the existing conditions and affected environment described in Chapter 3. For a tabular comparison of impacts of the alternatives, see the RMP/EIS Summary (Table S-2).

Alternatives NA and A through E have been re-analyzed within the context of changed U.S. Forest Service (USFS) management direction specified in the SEIS ROD. To estimate what future actions are likely to occur on USFS lands and to enhance the discussion of cumulative impacts, the analysis has drawn heavily upon the analysis in the Final SEIS and decisions in the SEIS ROD.

Direct, indirect, and cumulative effects are all considered to the extent identifiable in each analysis. Direct effects result from activities planned or authorized by the BLM under each alternative and occur at the same time and place. Indirect effects are caused by the action and occur later in time or are farther removed in distance, but are still reasonably foreseeable. Indirect effects generally occur when the public pursues opportunities provided by BLM management. For instance, hunting, fishing, and other recreational activities are the effects on socioeconomic conditions. Cumulative effects are those resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

In addition, the National Environmental Policy Act (NEPA) requires that the proposed action analysis in EISs address the following three topics:

- Relationship between short-term uses and long-term productivity.
- Irreversible or irretrievable commitments of resources.
- Adverse environmental effects which cannot be avoided.

These topics are sometimes addressed as separate topics or may be included, where relevant, as part of the discussion of environmental consequences for each component of the environment.

The baseline period to which predicted future effects are compared is normally 1984-1988, the period for which the existing plan was in effect at the start of EIS preparation and for which a wide range of relevant baseline data have been gathered and/or published.

Both short- and long-term time frames were considered. Short-term is the period of time during which the plan will be implemented, assumed to be at least 10 years. Short-term impacts include those resulting from harvest of timber sold during the ten-year period, even though such a harvest may occur two or three years after sale. Long-term is the period beyond 10 years. Whenever meaningful analysis depended on specificity provided by the 10-year timber management scenario, or for some cumulative effects that are primarily dependent on (forecasting) activities on private lands (e.g., effects on elk), long-term impacts were not analyzed in detail.

Valid existing rights would continue under all alternatives. Examples of valid existing rights include right-of-way grants issued but not yet constructed, mining claims filed prior to approval of the RMP in an area recommended for mineral withdrawal, reciprocal right-of-way agreements, withdrawal of public lands for use by another government agency, or an existing mineral lease. Valid existing rights may be held by other federal agencies, private individuals, or companies. Valid existing rights that have the greatest potential for adverse effects on BLM-administered land and resources include mining claims and reciprocal rights-of-way. The severity of the adverse effects would depend largely on the proximity of the action to sensitive resources. There is no reasonable way to predict or quantify these potential actions.

Preliminary analysis and scoping indicates that none of the alternatives would significantly impact the following: geology, topography, grazing, agriculture, prime and unique farmlands, wetlands, floodplains, paleontological values, or renewable energy use (e.g., wind, hydro, and biomass). Therefore, these topics are not discussed in this document. In addition, effects on wilderness values are not included since those values were addressed in the *Oregon Wilderness EIS* completed in 1990.

Use of Models

Analytical models have been used to assess some effects of the alternatives. Like all models of complex biological-physical or economic systems, these models necessarily simplify reality. While limited by current knowledge, these models represent a synthesis of the knowledge of BLM staff and/or outside scientists familiar with the subjects of concern.

Model evaluation involves extensive validation through testing and comparison of predictions with actual outcomes. In that sense, most of the models used are too new to be validated. In fact, such validation of most of these models would take decades. Nonetheless, aside from analyst intuition, they provide the most useful available methods for comparing probable differences in outcomes from implementation of the various plan alternatives. Because confidence in their numbers varies, they are more useful in all cases for comparison of the relative consequences of alternatives rather than precise predictions.

The application of the models to Alternative C and the PRMP are attended by lower levels of confidence than the analyses of other alternatives. This is partly due to the untested nature of many of the prescriptions of these alternatives. The confidence level in all analyses of the effects of the PRMP is also lower because the results of watershed analyses and Adaptive Management Area planning may modify both the rate and location of timber harvests, as well as management prescriptions. Adaptive management, however, will assure that objectives are met.

In addition to analyses of the consequences of the seven land-use allocation alternatives fully analyzed, BLM has conducted some sensitivity analyses of the effects of varying management approaches. Sensitivity analysis is a process of identifying opportunity costs associated with differing approaches to sensitive land-use allocations and other decisions. It can assist selection of an RMP by examining specific trade-offs that could result from making changes in single sensitive elements of an alternative.

Sensitivity Analysis

Sensitivity analyses of some consequences of several alternatives were conducted during preparation of the Draft RMP/EIS and summarized in Appendix IV-A of the draft RMP. Additional sensitivity analysis of the following potential changes in the PRMP have been made and are summarized in the Timber Resources section of this chapter.

- Excluding all critical spotted owl habitat from planned timber harvest.
- Foregoing some or all proposed intensive timber management practices (genetic tree selection, fertilization, and precommercial thinning/release).

Assumptions

The following assumptions were used as a basis for analysis of impacts:

- Sufficient funding and personnel would be available for implementation of the final decision. (If sufficient funding and personnel are not available, most environmental consequences would be less than predicted, but most effects on socioeconomic conditions would be greater.)
- The Probable Sale Quantity and annual average silvicultural practices for the alternatives would be approximately as shown in Table 4-1.
- The alternatives would be continued for many decades.
- Standard design features described in Chapter 2 (which include many of the mitigating measures that avoid, minimize, reduce, or eliminate potential environmental impacts) would be applied as described.
- Local climate patterns of historic record and related conditions for plant growth would continue. (See Appendix V for further discussion.)
- During the assumed ten-year life of the plan, approximately 15 miles of new roads would be constructed across BLM-administered lands by private parties under the terms and conditions of existing reciprocal right-of-way permits, short-term O&C road use permits, and FLPMA right-of-way grants.
- For analysis of cumulative effects, most private forest lands would be intensively managed with final harvest on commercial economic rotations ranging from 45 to 80 years.

The Probable Sale Quantity (PSQ) for the PRMP is an estimate of annual average timber sale volume likely to be achieved from lands allocated to planned, sustainable harvest. The use of PSQ, rather than “Allowable Sale Quantity” (ASQ) recognizes uncertainties in the estimate. Harvest of this

Table 4-1. Estimated Annual First-Decade Levels of Timber Management Activity by Alternative

	Alternative						
Activity [1] (acres except as noted)	**PRMP**	**NA**	**A**	**B**	**C**	**D**	**E**
Final or regeneration harvest	580	3,730	5,150	5,000	1,350	1,150	1,260
Commercial thinning/density management harvest	610	730	1,250	460	700	1,030	210
PSQ/ASQ Chargeable Volume (MMBF)	32[2]	254	294	267	86	76	65
Miscellaneous Volume (MMBF) [3]	5						
Road Construction (acres)	100	90	130	120	70	90	70
Road construction (miles)	18.6	16.6	24.5	22.3	13.2	16.4	12.4
Ground-based yarding	0	0	0	0	0	0	0
Cable yarding, no suspension	170	1,020	1,230	1,370	530	330	550
Cable yarding, partial suspension	290	1,890	2,690	2,530	520	490	550
Cable yarding, full suspension [4]	120	730	1,100	980	230	240	90
Broadcast burn	400	2,300	2,980	3,280	460	750	770
Underburn	50	0	0	0	50	80	90
Mechanical pile and burn	190	40	40	40	40	10	10
Hand pile and burn	120	1,480	1,940	1,430	850	480	350
Brushfield/hardwood conversion	120	590	790	1,040	520	820	240
Planting/regular stock	220	420	970	810	770	0	0
Planting/genetically selected stock	540	3,770	4,500	4,440	770	1,430	1,340
Vegetation control	5,610	5,260	5,210	5,070	4,610	4,740	4,450
Animal damage control	790	2,930	3,830	3,670	1,070	1,000	940
Precommercial thinning	3,470	4,080	970	470	880	210	290
Fertilization	1,200	4,800	7,920	6,990	4,730	3,350	2,590
Pruning	870	0	0	0	0	0	0

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[1] Estimates are derived from representative 10-year timber management scenarios and other sources.

[2] Volume based on coniferous volume only.

[3] Includes volume anticipated to be harvested in Late-Successional Reserves as density management, and as hardwood volume harvested in stand conversions. Miscellaneous volume has not been estimated for alternatives other than the PRMP.

[4] Includes aerial yarding.

approximate volume of timber is considered sustainable over the long term based on the assumptions that the available land base remains fixed, and that funding is sufficient to make planned investments in timely reforestation, plantation maintenance, thinning, genetic selection, forest fertilization, timber sale planning, related forest resource protection, and monitoring.

The PSQ represents neither a minimum level that must be met nor a maximum level that cannot be exceeded. It is an approximation because of the difficulty associated with predicting actual timber sale levels over the next decade, given the complex nature of many of the standards and guidelines. It represents BLM's best assessment of the average amount of timber likely to be awarded annually in the planning area over the life of the plan, following a start-up period. The actual sustainable timber sale level attributable to the land-use allocations and management direction of the PRMP may deviate by as much as 20 percent from the identified PSQ. The potential variables are discussed in the Timber Resources section of this chapter. As inventory, watershed analysis, and site-specific planning proceed in conformance with that management direction, the knowledge gained will permit refinement of the ASQ to be declared when a plan decision is made. The separable component of the PSQ attributable to lands in key watersheds carries a higher level of uncertainty, due to the greater constraints of Aquatic Conservation Strategy objectives and the requirement to do watershed analysis before activities can take place.

During the first several years, it is unlikely that the annual PSQ will be offered for sale. The PRMP represents a new forest management strategy. It will take time to develop new timber sales that conform to the PRMP.

Average annual timber sale volumes from thinnings in young stands in Late-Successional Reserves are also estimated. These volumes too are unlikely to be offered for sale in the first few years of plan implementation.

Ten-Year Representative Timber Management Scenario

A 10-year representative timber management scenario was developed based on the land use allocations for each alternative except the No Action alternative. These scenarios were used to assess potential short-term, site-specific impacts. The scenarios represent the Resource Area staffs' assumptions as to possible locations of timber harvest units and road locations. A total harvest scenario (harvest units and roads) was built for the land that would be available for timber harvest in Alternative A. This scenario was then adjusted to the land available for timber harvest in each other alternative except the PRMP.

For alternatives A through E, random spatial selection of timber harvest units was linked to the TRIM-PLUS allowable sale quantity calculation. The purpose of this linkage was to determine the 10-year scenario that meets management selection criteria and to provide the calculated probable sale quantity identified for the alternative. The selected scenarios were evaluated for practicality by Resource Area timber sale planners. Estimates of logging practices and average annual levels of associated activities and intensive management practices for the decade of the plan are displayed in Table 4-1. In borderline cases, the estimates assume the practice that results in greatest impact.

For the PRMP, the tie to a set of representative harvest units was not performed. One reason is that the representative timber harvest units and roads assumed for Alternative A would not be applicable to the PRMP because of its enlarged riparian reserve systems and other changes in the plan. A set of new 10-year representative harvest units could be developed to fit the PRMP, except that many of the intermittent streams are not currently mapped in the GIS. Without the full spatial representation of the riparian reserves, the resource area planners would not be able to evaluate the scenario for practicality.

Accordingly, for the PRMP, the acreage by age class and timber type scheduled for harvest in the first decade was randomly depleted in average harvest unit quantities from across the available land-use allocations and inventory to estimate the effects of harvest.

Due to unforeseeable events and adjustments made in site-specific planning, actual timber sale and management plans will differ from the 10-year scenarios. The scenarios provide an analytical tool, however, to help provide more specificity to analysis of impacts of the alternatives. Actions (such as timber sales) implementing the planning decisions will be analyzed before implementation to determine if impacts addressed in the EIS might differ significantly from those predicted based on the 10-year scenarios.

Ten-Year Mineral Development Scenario

Ten-year scenarios of expected mineral exploration and development activity have also been developed (see Appendix W).

Analysis of the alternatives is also based on their different levels of planned activities as shown in Table 2-1.

This EIS incorporates by reference the conclusions of the Final SEIS. Specifically incorporated are conclusions about Alternative 9 of the Final SEIS, which is embedded in the PRMP.

Incomplete or Unavailable Information

There is less than complete knowledge about many of the relationships and conditions of wildlife species, forests, the economy, and communities. The ecology, inventory, and management of large forests is a complex and developing discipline. The biology of the specific species prompts questions about population dynamics and habitat relationships. The interaction among resource supply, the economy, and rural communities is also the subject of an inexact science.

Because there is a substantial amount of credible information about the topics of this environmental impact statement, the central relationships and basic data are well established. The best available information was used to evaluate the alternatives. When encountering a gap in information, the question implicit in the Council on Environmental Quality regulations on incomplete or unavailable information was posed: Is this information "essential to a reasoned choice among alternatives"? (40 CFR 1502.22(a)). While additional information would often add precision to estimates or better specify a relationship, the basic data and central relationships are sufficiently well established that any new information would be unlikely to reverse or nullify understood relationships. Though new information would be welcome, no missing information was considered to be essential to a reasoned choice among the alternatives as they are constituted.

Nonetheless, the precise relationships between the amount and quality of habitat and the future populations of species are far from certain; there is a certain level or risk inherent in the management of forest lands even to standards based on conservative application of those relationships. For example, if the relationship between habitat and population were significantly different from how it now seems, or if management standards were to be broadly misapplied, the population and long-term viability of affected species would be at greater risk than that generally estimated in this document.

All other things being equal, the lesser the information, the greater the risk attributable to incomplete knowledge. That relationship is an impetus for the monitoring and adaptive management that is part of the PRMP in particular. Should there be new scientific information on change in habitat conditions not projected, there are provisions for changing management of the forest to reflect the new information and its needed management practices. This adaptive management process—which is guided by monitoring, research, and interagency oversight—provides additional assurance of compensating for possible catastrophic changes.

Mitigation

Mitigation is important in the design of the alternatives and implementation of any alternative. In general, mitigation is a measure taken to cause an action to become less harsh or less severe. From the CEQ Regulations (40 CFR 1508.20), mitigation includes:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

Mitigating measures have been incorporated and evaluated in the design of alternatives and throughout the discussion of environmental consequences in this chapter. For the actions analyzed in this RMP/EIS, mitigating measures are addressed primarily through land allocations, management practices, and standards as described in Chapter 2.

Listed below are some examples of commonly used mitigating measures that may be built into the design of alternatives.

- Selection of timber harvesting techniques and timing to minimize soil damage.
- Design and timing of prescribed burns to minimize effects on soils, wildlife habitat, and air quality.
- Wildlife tree retention.
- Elk forage seeding.
- Seeding and fertilization of exposed soil after road construction.
- Prompt reforestation of harvested areas.

Effects on Global Climate

Scientific opinion anticipates noticeable global warming during the 21st century. There is substantial scientific uncertainty, however, about the rate of such warming. According to a report of the Intergovernmental Panel on Climate Change, temperature increases could be as low as one degree centigrade or as high as five degrees centigrade by the year 2100 (Schneider 1991).

The primary factors leading to the expectation of warming are substantial increases in atmospheric carbon dioxide, nitrous oxide, methane, chlorofluorocarbons, and other trace gases attributed to human activity. BLM's land management activities in the planning area would primarily affect the amount of carbon dioxide. Forecasts suggest that global carbon dioxide may double from the level of 1900 sometime between the years 2030 and 2080 (Schneider 1989). The plan alternatives, however, would have only a slight effect on atmospheric carbon dioxide levels.

A key factor in assessing the impact of timber harvest and forest regrowth on the amount of carbon in the atmosphere is the amount of carbon stored within the trees of the forest. One analysis shows that forests managed on rotations of less than 100 years would store less than half the amount of carbon stored in old-growth stands (Harmon et al. 1990), leaving more carbon in the atmosphere. Analysis by Harmon et al. indicated that about 42 percent of timber harvested in the northwestern U.S. enters long-term storage in products, while paper production largely results in the loss of carbon dioxide to the atmosphere. Commenters have suggested that some factors relevant to assessing the impact of timber harvest levels on global climate were apparently not considered in the analysis by Harmon et al. which resulted in the effect of such harvest being overstated. The factors that may have been disregarded include: (1) the slow decomposition of products entering landfills, (2) possible increases in emissions if fossil fuels are burned in lieu of wood or wood products, and (3) emissions associated with substitution of alternative construction materials for wood, or substitution of wood from virgin forests outside the northwestern U.S.

The calculations of Harmon et al. indicate that each million acres of old-growth forest harvested in the northwestern U.S. would add less than one-tenth of one percent to the total carbon currently in the atmosphere. The largest acreage of old-growth (age class 200+) anticipated for harvest over a ten-year period in any alternative is 51,500 acres in Alternative A, while the Proposed Resource Management Plan (PRMP) would harvest 1,100 acres of old growth. Although young, fast-growing trees store less carbon in total, they absorb more carbon from the atmosphere than older trees. Fertilization, vegetation management, and planting genetically-selected stock all enhance this effect. In mature and old-growth stands, the release of carbon dioxide through decomposition tends to balance the amount of carbon dioxide absorbed through the growth process. Logging—especially clearcutting—increases the rate of decomposition of debris on the forest floor, releasing more carbon dioxide. In the absence of timber harvest and over time, wildfires would have similar effects, but of a lesser magnitude. Not until a young stand reaches the stage of canopy closure does its carbon uptake offset the release from decomposition (Alaback 1989).

One forest practice directly contributing carbon dioxide to the atmosphere is prescribed burning after timber harvest. In the absence of burning, however, the decay of the same wood over many years would contribute a similar amount of carbon dioxide. The largest amount of prescribed burning anticipated over ten years in any alternative would be 1,445,280 tons in Alternative B (see Effects on Air Quality and Table 4-2). Under the PRMP, 212,100 tons would be burned. The levels of burning in Alternative B and the PRMP would contribute a maximum of 2,167,920 tons and 318,600 tons of carbon dioxide to the atmosphere, respectively. (Burning a ton of slash can create up to 1.5 tons of carbon dioxide as the released carbon combines with oxygen.) In the long term, a managed forest would be in balance with its release and absorption of carbon dioxide, just as in an unmanaged forest. Assuming that half of newly-injected carbon dioxide would remain in the atmosphere (Schneider 1989), a decade of harvest of some of the older forest and prescribed burning under the PRMP could add .0001 percent to the carbon in the world's atmosphere. This would be an unavoidable adverse impact.

The cumulative effects of BLM activities under the PRMP and similar activities proposed or anticipated on forest lands in western Oregon and Washington for the expected ten-year life of the RMP, would add an estimated 100 million tons of carbon dioxide to the world's atmosphere, increasing carbon dioxide to the world's atmosphere, increasing carbon there by .01 percent. This includes 60 million tons from old-growth timber harvest indicated by Proposed RMPs for other BLM western Oregon districts and by the U.S. Forest Service under the SEIS ROD, and as much as 40 million tons from prescribed forest management burning by all landowners as controlled by the ceilings established in the Oregon Smoke Management Plan and the Washington State Smoke Management Plan. The effect on global climate would be slight. Total increases in atmospheric carbon dioxide from all worldwide sources, by comparison, are occurring at a rate of almost one-half percent annually (Trexler 1991). For further discussion on Analytical Assumptions about Global Climate Change, see Appendix V.

Effects on Air Quality

General

Major sources of air pollutants associated with BLM resource management activities are smoke from prescribed burning, application of herbicides used to control unwanted vegetation, and dust from the use of unsurfaced roads and from road construction and maintenance. Effects associated with herbicide use are described in the Final EIS for *Western Oregon-Management of Competing Vegetation* to which this RMP/EIS is tiered (see Appendix I-C of the draft RMP).

Dust from new road construction and maintenance of older unpaved roads normally settles within a short distance from the point of origin. It has a negligible effect away from the construction and maintenance sites. Dust associated with road use also has negligible effect away from unpaved roads. Road dust would have localized effects on residents within the rural interface area (RIA) for all alternatives. The major adverse effect would be during the summer months when dust is produced from both public and administrative use of unpaved roads.

Prescribed burning is the only resource management activity proposed under any alternative that could have a notable adverse effect on local air quality. The effect of smoke from prescribed burning would either reduce visibility within a project area—or under adverse meteorological conditions—could concentrate the smoke around the project site. Under all alternatives, prescribed burning would comply with the guidelines established by the Oregon Smoke Management Plan (OSMP) and the Visibility Protection Plan. The focus of the effects by alternatives is on PM 10 (Particulate Matter Smaller Than 10 Micrometers) because these emissions from prescribed fire are the criteria pollutants that could have the greatest impact on nonattainment areas and rural residents. In addition to wildland prescribed fire, typical sources of PM 10 include industrial processes, woodstoves, roads, agricultural practices, and wildfires.

Projected Emissions

Historically, annual slash treatment levels have varied between 50 and 90 percent of the total harvested acres. Major limitations have been air quality restrictions and prescribed fire prescription parameters. Estimates of the expected annual acreage of prescribed fire use were calculated for each of the alternatives (see Table 4-2). Broad assumptions regarding the ecological need for prescribed burning, the hazard reduction that might be necessary for risk management, and the amount of prescribed burning necessary for site preparation and other silvicultural treatments were made at this planning level. These estimates are very generalized because many assumptions about the level of prescribed fire use for each land allocation within the district cannot be validated until after completion of watershed analysis and Late-Successional Reserve assessments.

Species mitigation measures (including habitat enhancement) within the Matrix may sometimes increase the use of prescribed fire on a site-specific basis, but are generally expected to reduce the use of fire. Air quality analyses at more site-specific planning levels, such as the project level, are critical in determining the actual amount of prescribed fire that may be needed on the landscape.

The amount and type of prescribed burning projected under Alternatives C, D, E, and the PRMP represent a shift in emphasis compared to historical uses of prescribed fire. In the past decade, the majority of prescribed burning has consisted of broadcast burning of logging slash for site preparation and management of competing vegetation. Some of this burning simultaneously contributed to fuels hazard reduction. These historical uses of prescribed fire are maintained and emphasized in Alternatives NA, A, and B. Use of broadcast burning to meet silvicultural objectives would be a part of all alternatives, while Alternatives C, D, E, and the PRMP use a combination of under-canopy and broadcast burning to meet the fuel treatment objectives.

Under the PRMP, prescribed burning emphasizes ecosystem processes restoration, site preparation, habitat restoration and maintenance, and hazard reduction. In this alternative a portion of the proposed burning would be underburning in both natural and managed stands. Burning for hazard reduction and site preparation may frequently take place in stands with many more trees retained after harvest than in the past, necessitating changes in prescribed fire techniques. Burning piles of slash after harvest, or for hazard reduction, during the most favorable emission dispersion conditions continues a recent trend in fuels management leading to further emission reductions and reduced impacts.

Table 4-2. Annual Fuel Treatments, Consumption, and Emissions by Alternative

			Alternatives					
	Baseline	PRMP	NA	A	B	C	D	E
Treatment (Acres)								
Broadcast Burn	1,893	400	2,300	2,980	3,280	460	750	770
Pile and Burn	0	310	1,520	1,980	1,470	890	490	360
Underburn	0	50	0	0	0	50	80	90
Total	1,893	760	3,820	4,960	4,750	1,400	1,320	1,220
Fuel Consumption [1] (Tons)								
Broadcast	66,444	14,040	80,730	104,598	115,128	16,146	26,325	27,027
Pile and Burn	0	6,200	30,400	39,600	29,400	17,800	9,800	7,200
Underburn	0	1,000	0	0	0	1,000	1,600	1,800
Total	66,444	21,240	111,130	144,198	144,528	34,946	37,725	36,027
PM 10 Emissions [2] (Tons)								
Broadcast	1,565	183	1,049	1,360	1,497	210	342	351
Pile and Burn	0	25	122	158	118	71	39	29
Underburn	0	13	0	0	0	13	21	23
Total	1,565	221	1,171	1,518	1,615	294	402	403
Carbon Dioxide Emissions [3] (Tons)	99,666	31,860	166,695	216,297	216,792	50,919	56,588	54,041

[1] 35.1 Tons of fuel consumed in broadcast burn.
20 Tons of fuel consumed in Pile and Burn and in Underburn.

[2] Estimated 26 lbs. PM 10 emissions per ton of fuel consumed in Broadcast Burn and Underburn.
Estimated 20 lbs. PM 10 emissions per ton of fuel consumed in Pile and Burn.

[3] Carbon Dioxide 1.5 tons per ton of fuel consumed.

The shift in emphasis from broadcast burning to underburning has some inherent smoke management risks. Large areas may burn in mosaics with varying fire intensity and severity. While this mimics natural underburning, there are risks associated with retaining coarse woody debris; the likelihood for reburning is increased, as is the possibility for a prescribed burn to escape the planned burn area. Consequently, the potential for additional, unanticipated emissions is also increased. Furthermore, costs associated with the need for rapid extinguishment of smoldering fuels may be high.

Scheduling a majority of prescribed fire primarily during the period starting in May and ending in July minimizes the amount of smoke emissions by burning when duff and dead woody fuel have the highest moisture content which reduces the amount of material actually consumed. Broadcast burning would be planned during the spring to reduce damage to the site from high intensity burning and to facilitate control of the units being burned. Control of prescribed fire becomes increasingly more difficult after July. Sites proposed for underburning are most likely to come into prescription in July, August, and September due to the higher fuel moistures under the forest canopy earlier in the year.

By conducting prescribed burning under advantageous weather conditions, subsequent wildfire emissions are expected to be reduced due to a decreased amount of available fuel and a lowered risk of large-scale wildfire. The local impacts to residents in rural communities, nonattainment areas, and Class I areas may be reduced through the use of an active fuels management program that may include prescribed fire. Because extensive wildfires frequently occur after periods of drought, fuel consumption may be very high. Wildfires may allow smoke to enter Designated Areas as well as nonattainment areas, while prescribed fires are specifically designed and conducted to minimize both their emissions and impacts.

This air quality analysis focuses primarily on the impacts of particulate matter from prescribed burning due to the large quantities emitted from fires, the potential contribution of PM 10 from prescribed and wildfires to concentrations above the PM 10 standard, the major reduction of visibility caused by PM 10, and the role PM 10 plays as a carrier of other toxic pollutants.

Emissions by Alternatives

Under all alternatives, smoke emissions from BLM burning would be less than the 1984-1988 average historic emission level (see Figure 4-1). The 1976 to 1979 baseline is used to measure district progress towards the 50 percent reduction goal for total suspended particulate (TSP) emissions from forestry burning for all of western Oregon by the year 2000 (see Chapter 3, Air Quality, for further discussion).

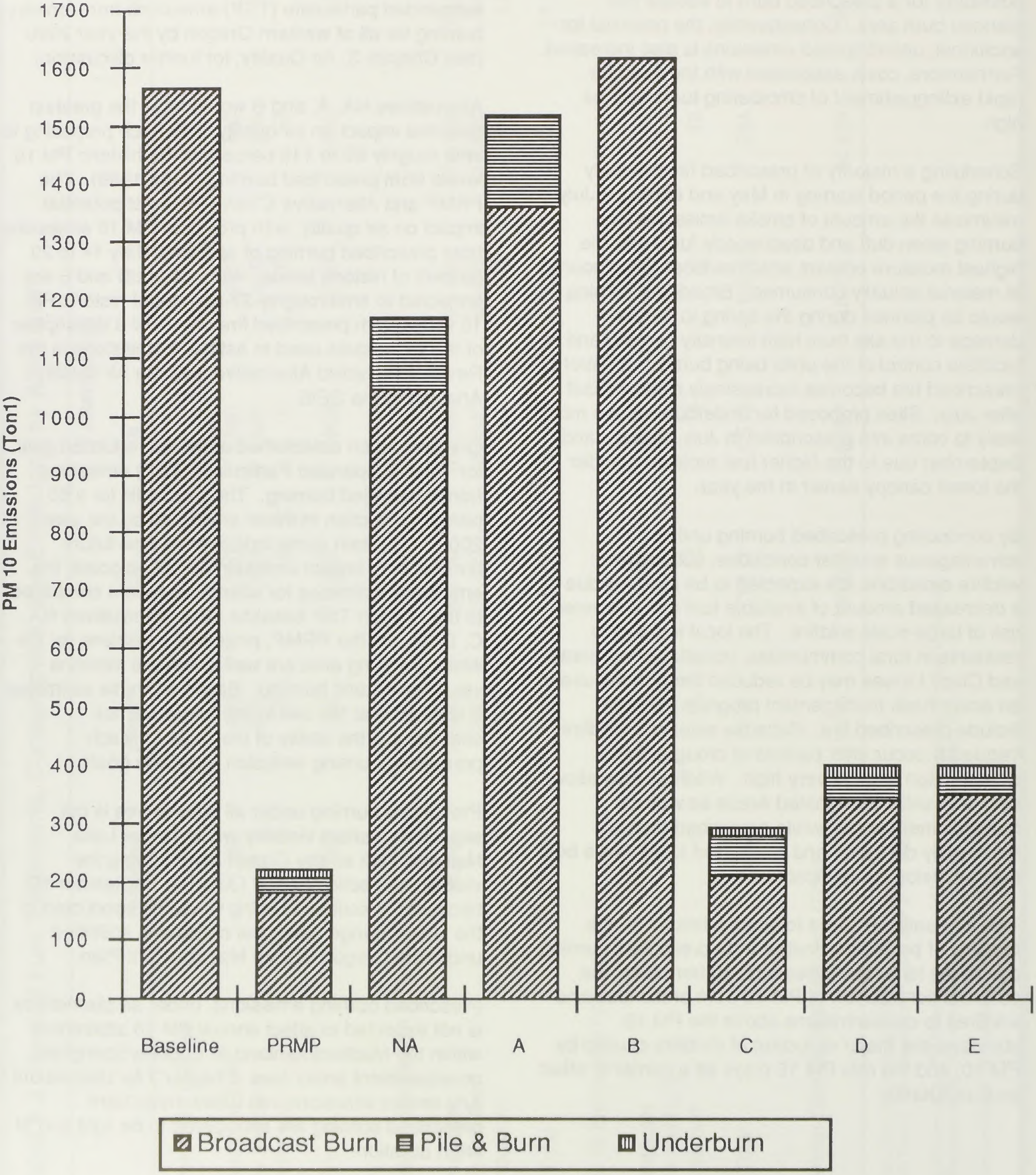
Alternatives NA, A, and B would have the greatest potential impact on air quality, with each proposing to emit roughly 80 to 116 percent of the historic PM 10 levels from prescribed burning (1984-1988). The PRMP and Alternative C have the least potential impact on air quality, with projected PM 10 emissions from prescribed burning of approximately 14 to 20 percent of historic levels. Alternatives D and E are projected to emit roughly 27 percent of historic PM 10 levels from prescribed fire use. For a description of the techniques used to estimate emissions in the Revised Preferred Alternative, see the Air Quality Analysis in the SEIS.

Oregon has an established emission reduction goal for Total Suspended Particulate (TSP) emissions from prescribed burning. The goal calls for a 50 percent reduction in these emissions by the year 2000. To obtain some indication of how future burning may impact emission reduction goals, the emissions estimates for alternatives were compared to the Oregon TSP baseline. For Alternatives NA, C, D, E, and the PRMP, projected emissions for the entire planning area are well below the baseline value for historic burning. Based on these estimates, it appears that fire use in the future will not compromise the ability of the State to reach prescribed burning emission reduction goals.

Prescribed burning under all alternatives is not expected to affect visibility within Crater Lake National Park or any Class I areas during the visibility protection period (July 1 to September 15), because prescribed burning would be conducted in the Coast Range under the conditions specified under the Oregon Smoke Management Plan.

Prescribed burning emissions, under all alternatives, is not expected to affect annual PM 10 attainment within the Medford/Ashland or Eugene/Springfield nonattainment areas (see Chapter 3 for discussion). Any smoke intrusions into these areas from prescribed burning are anticipated to be light and of short duration.

Figure 4 -1. Annual PM 10 Emissions by Alternative



The greatest potential for smoke intrusions into the nonattainment areas would come from underburning activities proposed under Alternatives C, D, E, and the PRMP. Alternatives A and the NA would have less potential because most of the burning would be accomplished through broadcast burning, alternative treatments (hand pile and manual treatment), and the no treatment options. Even though the risk of an intrusion is greater during underburning, the severity is less because the level of emissions and the amount of fuel burned are reduced compared with broadcast and pile burning.

Underburning emissions would average between .25 and .50 tons for each acre burned, while emissions from broadcast and pile burning (both hand and tractor) would average between .50 and .90 tons per acre. The difference in emissions is due to the higher burning intensities needed for broadcast burning and the increase in burning efficiency when material is piled and burned. In addition, further reductions in level of emissions from underburning could be accomplished by rapid mopup of the burned area immediately after ignition. Smoldering can be responsible for up to 90 percent of the total PM 10 emissions produced.

Total smoke emissions and a greater chance for intrusions from prescribed burning would be the highest under Alternatives A, B, and the NA, and lowest under the PRMP when compared with the base period. The increased amount of underburning under Alternatives C, D, E, and the PRMP compared to the base period would result in less total emissions, but the risk of smoke intrusions may increase.

Prohibition of prescribed burning in the RIAs under Alternatives D and E would reduce short-term adverse visibility effects and the risk of smoke intrusions into adjacent rural areas. The accumulation of fuel, however, would have an increased risk of stand replacement wildfire. This increased wildfire risk would have the potential to affect wildfire emissions and to inflict property and resource damage.

Conclusions

Current avoidance strategies for prescribed fire assume that smoke can be lifted from the project site and dispersed and diluted by transport winds. However, underburning (as proposed under Alternatives C, D, E, and the PRMP) requires a low intensity burn that would not have the energy to lift the smoke away from the project site. Smoke retained onsite could be transported into portions of nonattainment areas if it is not dispersed and diluted by anticipated weather conditions. Localized concentration of smoke in rural areas away from nonattainment areas could continue to occur during prescribed burning operations.

Alternatives A, B, and the NA are projected to result in the highest total PM 10 smoke emissions as well as greater chance for intrusions from prescribed burning. The PRMP would produce the lowest level of emissions and least risk of smoke intrusions. Alternatives C, D, E, and the PRMP would increase the amount of underburning compared to the base period. While emissions would be less, the risk of these lighter intrusions would increase under these alternatives.

Determinations of the cumulative smoke impacts of all federal burning and whether this burning conforms with the Clean Air Act will be evaluated through the Watershed Analysis process. This level of planning will be coordinated among neighboring federal agencies to assure that the proposed use of prescribed fire needed to meet ecosystem management as directed by the SEIS ROD does not violate the State Implementation Plan and the Clean Air Act.

Effects on Soils

Introduction

Long-term soil productivity refers to the ability of soil to sustain the natural growth potential of plants and plant communities over time. Because most forest uses ultimately depend on a productive soil resource, maintenance of long-term soil productivity is widely recognized as a basic requirement of forest management. The extent to which long-term soil productivity is affected by management activities is not precisely known since such research has only recently begun. However, it is known that forest management practices have the potential to reduce natural productivity unless carefully- developed prescriptions are used. Implementation of the management prescriptions (Chapter 2) and best management practices (BMPs, Appendix H) would prevent unacceptable degradation of the soil resource. Monitoring will determine whether the prescriptions and BMPs are effective and being correctly applied.

Both soil and non-soil factors influence soil productivity. Non-soil factors such as climate and geology are not influenced by management activities. Soil factors which can be modified by management activities include moisture, aeration, bulk density, availability of organic matter and nutrients, and biology. Since the district's soils differ in their degree of sensitivity to disturbances, determining the suitability of management practices is an important preliminary step in preventing or minimizing adverse soil related impacts. This determination would be made during the interdisciplinary team review of specific projects.

The Timber Productivity Capability Classification (TPCC) Inventory identified fragile sites that are judged to be incapable of supporting a sustained yield of forest products (Fragile Gradient Nonsuitable Woodland category, or FGNW). No planned timber harvest would take place on these lands under any of the alternatives. While these lands would be managed primarily for their non-timber values, road construction and timber harvest could occur on minor portions to gain necessary access to other lands.

Other areas identified in the TPCC as being subject to unacceptable soil productivity loss from management activities unless specific restrictive or mitigating measures are used include the Fragile Suitable Restricted category. These sites would be managed using BMPs and other mitigating measures to minimize impacts from management activities. TPCC classes are defined in the Timber Section in Chapter 3, including Table 3-46; in the Soils Section in Chapter 3; and in more detail in OSO Manual 5251, Coos Bay Supplement.

By definition, fragile soils are more susceptible to degradation by any kind of soil-disturbing activity than are non-fragile soils. The FGR2 (Fragile Gradient Restricted 2) soils are more fragile than the FGR1 (Fragile Gradient Restricted 1). This subdivision of Fragile Gradient Restricted class was used due to the large acreage of steep land on the district.

In all alternatives except E, approximately 54 percent of the harvest acres would be in fragile classes, almost all of which is FGR1 and FGR2. Alternative E, which specifically excludes timber harvesting of FGR2 lands, has only 26 percent in fragile classes—all in FGR1. Because Alternatives NA, A, and B would harvest more acres than the other alternatives, more fragile acres (and more non-fragile) would be harvested. Alternatives C, D, E, and the PRMP would harvest fewer acres of soils classified as fragile (Table *4-3*). The PRMP would harvest significantly fewer acres than any other alternative and would have significantly less potential for adverse impacts on long-term soil productivity.

Impacts on long-term soil productivity resulting from timber management activities would be expected to be minimal and within acceptable limits, assuming successful implementation of proposed BMPs (Appendix H), the practices listed in Chapter 2 under "Management Direction Common To All Alternatives," and other site-specific measures. The alternatives that harvest more acres (Alternatives NA, A, and B), and especially more fragile acres, would have a higher potential risk of not achieving fully successful implementation of BMPs. If BMPs were not successfully implemented, there could be excessive surface erosion, compaction, and fine organic matter losses, which together could result in reduced soil productivity.

Forest management and other activities that disturb soils and could affect soil properties and productivity include road construction, timber harvest, site preparation, mining, recreation, and OHV use (see Table 2-1 and Table 4-1). Some kinds and degrees of soil disturbances are considered acceptable while others are detrimental to long-term soil productivity. The extent of soil disturbance depends on many factors, including soil type and condition, acres harvested, methods of harvest and site preparation, topography, successful implementation of planned

Table 4-3 . Approximate Acres of TPCC Fragile Suitable Restricted Categories Harvested Annually by Alternative for the First Decade

Category	PRMP	NA	Alternative A	B	C	D	E
Slope Gradient [1]							
FGNW	0	0	0	0	0	0	0
FGR1	140	840	1,150	1,120	300	260	280
FGR2	160	1,050	1,450	1,410	380	330	0
Soil Moisture (FS-R)	10	60	80	80	20	20	20
Soil Nutrients (FN-R)	0	30	40	40	10	10	10
Mass Movement (FP-R)	0	50	70	60	20	20	20
Surface Erosion & Ground Water [2] (FM-R & FW-R)	-	-	-	-	-	-	-
Total Fragile	**310**	**2,030**	**2,790**	**2,710**	**730**	**640**	**330**
Non-fragile	270	1,700	2,360	2,290	620	510	930
Total Harvest	**580**	**3,730**	**5,150**	**5,000**	**1,350**	**1,150**	**1,260**

[1] A small amount of non-chargeable volume may be harvested from the FGNW class to access other lands, or to create logical logging units.

[2] Less than five acres per year of harvest in these TPCC classes.

practices and mitigation measures, and the skill of individual equipment operators.

Detrimental impacts can be avoided or ameliorated, and long-term productivity maintained, if good soil management practices are planned and used. The most common types of disturbances affecting soils and associated long-term productivity are displacement and compaction, erosion and mass wasting (landsliding), and alteration of nutrient status. A summary of the effects of these three disturbance types on long-term soil productivity by the various alternatives are discussed in the following subsections. Appendix IV-D of the draft RMP contains more detail and discussion on each of these disturbance types.

Some researchers suggest, however, that long-term soil productivity—even on Suitable Commercial Forest Land (SCFL) sites—may not be sustainable over the long term. Soil fertility may be diminished over time by repeated cycles of harvest, site preparation, and control of competing vegetation (Perry and Maghembe 1989). This statement could presumably include the intensively-managed portions of all alternatives. (See the Nutrients Status section regarding use of the FORCYTE-11 model.)

Overall, the long-term adverse impacts on soil productivity would be less under Alternatives C, D, E, and especially the PRMP, than the other three alternatives due to considerably fewer acres being intensively managed, and fewer acres being at risk of not having successful implementation of BMPs and mitigating measures. Another factor limiting adverse impacts on soil productivity under these four alternatives (especially in D and the PRMP) is that less biomass would be removed from the site as more conifers, hardwoods, snags, and down woody material would be retained onsite. Alternatives NA, A, and B—which would have considerably more acres burned for site preparation than Alternatives C, D, E, and the PRMP—would have more potential for adversely affecting soil productivity (Table 4-1).

It is assumed that timber harvest would occur proportionally on all soil types in all alternatives, except for Alternative E which would remove all areas classified as FGR2 from the intensive timber base. Also, in the PRMP, significant increases in riparian protection will mean little or no harvesting disturbance in these areas, which are often fragile. Major differences among alternatives are the total acres harvested and the number of fragile soil acres that would be under intensive management.

Because more acres of harvest and site preparation are proposed under Alternatives NA, A, and B, these three alternatives would have more acres requiring fully successful implementation of management practices to maintain long-term productivity. The PRMP would require successful implementation of BMPs on the least number of acres by a significant margin (Table 4-3).

Although management prescriptions and mitigating measures are designed to keep the extent and duration of adverse effects on soils within acceptable levels, adverse impacts cannot be completely eliminated. For example, monitoring of harvested and burned units on the district during the past five to ten years indicates that 10 percent of units burned too hot, which exceeded the standards for maintaining adequate fine organic material including duff and litter. Further, the construction of rocked and/or excavated roads, quarries, developed recreation sites, and water impoundments are considered to be irreversible or irretrievable commitments of the soil resource due to the long time needed to revert such disturbed areas to natural conditions.

Compaction and Displacement

According to research, some impacts on growth are created by detrimental soil compaction and displacement as a combined effect, with the two factors being considered inseparable. Detrimental soil compaction, which is assumed to occur at depths greater than two inches, is evidenced by an increase in soil density of 15 or more percent (USFS standard in Forest Service Manual Supplement 45, Section 2520.4) over the undisturbed level. See Appendix IV-D of the draft RMP for additional discussion of compaction. While Dyrness (1967) and Ruth (1967) both reported soil disturbance created by high-lead and skyline cable yarding systems, tree growth impacts from cable yarding are inconclusive because the available information is limited.

Timber harvest and site preparation methods, together with soil type and conditions during operations, determine the degree of soil compaction and displacement. The proposoal under all alternatives that most timber harvesting be accomplished using cable systems capable of partial or full-log suspension would avoid or minimize soil compaction and displacement. In Alternatives NA, A, B, and D, partial or full-log suspension during yarding is proposed on 70 to 75 percent of acres harvested; Alternatives C, E, and the PRMP would use log suspension yarding systems on 55 to 65 percent of acres harvested (Table 4-1). Hi-lead cable systems, with no suspension required, would be used on the remainder of the acres harvested. Aerial yarding systems (helicopter or balloon) are included with the log suspension systems and would be used on less than 10 percent of acres. About 40 acres per year of mechanical site preparation are proposed in most Alternatives, except D and E which would have only 10 acres per year. Any impacts to the soil from tractor logging would be insignificant due to the small acreage planned for such harvest methods under any of the alternatives.

On those sites subjected to ground-based yarding and/or mechanical site preparation, implementation and amelioration practices listed under "Management Direction Common To All Alternatives" in Chapter 2 would limit growth loss to less than one percent. Since all management practices would be planned and implemented to avoid detrimental compaction/ displacement for all alternatives, there would be minimal adverse growth impacts under all alternatives (Appendix IV-D of the draft RMP). Alternatives with more acres harvested (NA, A and B) would be at greater risk for unsuccessful implementation of BMPs and other protective measures and greater potential to create adverse impacts on site productivity.

Erosion and Mass Wasting (Landsliding)

Soil is an anchoring medium for plants and a reservoir of readily available water and nutrients for plant growth. Natural surface erosion rates in undisturbed forested areas of western Oregon are very low. Overland flow of water is rare due to the usually thick protective cover of vegetation, duff and litter, and the high infiltration rate of the soils. In general, any soil loss where there are reductions in soil nutrients, water supplying capacity, and the rooting zone is considered to have a negative effect on long-term soil productivity. Alternatives C, D, E, and especially the PRMP—which have considerably fewer acres allocated to intensive forest management and large acreages in extended rotations (compared to Alternatives NA, A, and B)—would have less long-term adverse impacts on these three soil productivity factors. Productivity analysis is not conclusive, however, because available data does not relate surface erosion to forest soil productivity. An assumption in the analysis was that topsoil removal would reduce productivity.

Management activities can accelerate surface erosion processes by creating more exposed and/or compacted soil. Compacted soils cannot absorb water fast enough during heavy rains to prevent runoff, and overland flow of water can cause rills and gullies. Eroded soil may move only a short distance and be redeposited onsite with minimal impact on long-term soil productivity. If the erosive force is great enough, soil may be carried off-site and into streams as sediment.

The management activities that could cause the most soil disturbance, and subsequently have the greatest potential for increased erosion, are road and landing construction, log yarding, machine piling and scarification, broadcast burning, and mining. Implementation of "Management Direction Common To All Alternatives" (Chapter 2) and BMPs (Appendix H), however, would prevent or minimize compaction, bare soil exposure, and potential erosion.

Landsliding is considered to have a relatively minor effect on long-term soil productivity, but significant impacts on water quality, fish habitat, and long-term productivity in the landslide "track."

The TPCC mapping identified five categories of fragile soils (see Table 4-3). No alternative would harvest the 31,000 acres of FGNW lands, the most fragile on the district. These have been removed from the intensive timber base. Alternatives NA, A, and B—which harvest more acres classified in TPCC as Fragile Gradient Restricted and Fragile Mass Movement Restricted categories—would have more potential for increasing landsliding. Alternatives C, D, E, and especially the PRMP, should show a substantial decrease in potential erosion related to landsliding, primarily because considerably fewer acres of fragile land would be harvested. Other factors that would reduce soil erosion impacts in these four alternatives would be slightly fewer roads constructed and fewer acres of site preparation. These reductions in activity are primarily due to the large acreage proposed to be managed on long rotations (150 to 300 years), in riparian reserves, or to remain unharvested for the protection of other resources. By removing the 87,200 acres of FGR2 lands from the intensive timber base and requiring a significant increase in riparian protection in first and second order draws, Alternative E would have the least landslide potential of all alternatives. The PRMP would also have a much lower landslide potential rate because fewer total acres would be harvested and a large percentage of district lands would be in unharvested riparian reserves. Landslide potential is often higher on steep riparian areas than on other steep lands.

Under Alternatives C, D, and the PRMP, more trees would be retained per acre of land harvested, promoting a minor increase in soil stability. The analysis considered that reserved trees could be left in small clumps at the bottom of units, along draws, at the edges on ridgelines, or dispersed throughout units. Another assumption was that a minimum of approximately 12 to 15 trees per acre would be retained under Alternative C, and 6 trees per acre would be retained under the PRMP.

Nutrient Status

Because of the interdependence between above-ground organic matter supplies and soil nutrient cycling and availability, management of the surface organic material can strongly influence soil productivity. Decaying plant components—including large down woody debris—produce an organic layer on the soil surface which gradually decomposes and is slowly incorporated as soil organic matter. This process provides plant nutrients, a supply of energy to soil microorganisms, and a medium for water storage. Soil microorganism activity has been directly linked to soil productivity (Harvey et al. 1979). Nitrogen is a limiting nutrient on many Pacific Northwest sites, and the surface organic layer (duff) is a primary source of nitrogen for tree growth.

Different forest management prescriptions can have variable impacts on long-term productivity. Harvest intensities that remove the most organic material from a site and high intensities of site preparation activities (e.g., high intensity, long-duration fire, and “clean” mechanical piling) would have a very high potential for decreasing long-term soil productivity.

The potential for negative long-term soil productivity impacts would be greatest when harvesting and/or site preparation activities are most intense and frequent as under Alternatives NA, A, B, and the intensively-managed forest areas under the other alternatives. Alternatives C and the PRMP with less frequent harvest and site preparation activities, and considerably fewer acres harvested in the case of the PRMP, would have the least potential for impacting long-term soil productivity and site quality.

The soils analysis assumed that slash burning would be avoided on highly sensitive soils in most instances, and that on other soils the burn prescriptions would be designed to protect beneficial soil properties and that low-to-moderate burn intensities would be used (see Chapter 2). If this protection does not occur, long-term soil productivity may be decreased. However, if burn prescriptions and BMPs are implemented as planned, soil organic matter and closely related long-term site productivity should be acceptably maintained in all alternatives (FORCYTE-11, Appendix IV-D of the draft RMP).

Differences between alternatives in the amount of land fertilized depend on the amount of land allocated for intensive timber production. Generally, it was assumed that fertilization would be planned for all well-spaced stands in the intensive timber base, including Alternatives NA, A, B, D, and E, and the intensively-managed portions of C and the PRMP. Under Alternative C and the PRMP's Late Successional Reserves (LSRs) and Connectivty/ Diversity Blocks (C/DBs), it was assumed that fertilization could be used to hasten development of old-growth character in a stand. Fertilization would enhance growth on well-managed sites or help restore growth on sites where previous practices have reduced the soil productivity by significantly reducing its nutrient status. Fertilization would not substitute for excessive organic material removal from a site nor be a planned mitigation.

Soil Biology

Management activities affect soil organisms and, in some cases, could result in detrimental impacts on site productivity. Long-term impacts to soil organisms would be minimized by using management prescriptions that reduce soil disturbance severity, maintain soil organic matter levels, and recognize the value of using indigenous host species and associated soil organisms. For instance, red alder acts as a host for a symbiotic nitrogen-fixing bacteria that attach to its roots as nodules and can produce considerable amounts of nitrogen. Although none of the alternatives specifically require the maintenance of red alder, those alternatives that indirectly encourage its growth would promote increased soil productivity. The PRMP indirectly promotes alder growth by requiring significant acreages of Riparian Reserves.

There would be more disturbance of soil organisms under Alternatives NA, A, and B due to their higher harvest acreage. Soil organisms would be less affected under Alternatives C, and in the LSRs and C/DBs of the PRMP, due to larger amounts of woody debris being retained onsite in these alternatives. This retention would be a result of the lower harvest volumes and longer harvest rotations of these two alternatives.

FORCYTE-11

Forest management activities can have a dramatic effect on nitrogen status and associated productivity trends. The FORCYTE-11 model (Kimmins and Scoullar 1989) was used to estimate long-term productivity trends by simulating yields of the various management practices and evaluating and comparing long-term productivity trends. Because the model has not been validated, its predictive capability is uncertain. Also, the model was not calibrated for multi-storied stands and is considered less applicable in parts of the PRMP. The model did, however, produce results that appear reasonable and consistent, and still has some comparative value in the case of the PRMP—especially on the GFMA lands. The procedures used for management prescription analysis and the complete results of trend analysis are discussed in Appendix X . Following are some results and observations of the FORCYTE-11 simulations:

- Long-term soil productivity would be maintained in the two distinct management areas of the PRMP: the 60-year rotations in the general forest management areas, and the 150-year rotation in the Connectivity/Diversity Blocks. There is no planned harvest in the LSRs or the Riparian Reserves.

- Long-term soil productivity would be maintained in all of the alternatives.

- In the intensive forest management areas of all alternatives, some decades would require harvest of 40- to 60-year-old timber stands until a regulated forest at CMAI was reached. Because this practice would not occur repeatedly on the same acres, only minimal impact on long-term productivity is expected.

- For short rotations (less than 50 years), long-term productivity would not be maintained when burning is used as a site preparation tool, even with prescriptions using heavy fertilizer applications. An occasional harvest of young timber is not considered to be significant.

- The more frequent and/or intense the burns, the more likely timber productivity and soil site quality would decrease over time. Specifically, 40-year rotations using any broadcast burn prescription would not maintain productivity over the long term.

- Fertilization would compensate for nitrogen losses, especially on shorter rotations where more fertilizer applications occur over time. Fertilization would not, however, maintain organic matter in the soil which is essential to many beneficial soil properties such as porosity, water-holding capacity, cation exchange capacity, and biological activity.

Nutrient Status, Curry County

Because the FORCYTE-11 model is not calibrated for conditions of the Klamath Mountain geographic province, this model was not used to predict long-term productivity trends in the central and southern portions of Curry County. For example, vegetation associations are distinctly different from the Coast Range and Cascade Provinces of western Oregon. Of particular significance is the widespread occurrence and competitiveness of tanoak in portions of Curry County.

Another difference is that fertility levels, which are a function of the geologic formations and the soils that are developing from them, are distinctly lower on most of the approximately 30,000 acres of BLM-administered public domain land in Curry County. Organic matter levels, both on and in the soil, are also lower. The lower soil fertility is reflected in the average site index for Curry County of 99, as compared to 125 for the rest of the district (50-year base).

Adverse impacts on long-term soil productivity in Curry County resulting from implementation of any of the alternatives, including the PRMP, would be expected to be minimal and acceptable assuming proper implementation of the prescriptions listed in Chapter 2 under “Management Direction Common to All Alternatives,” and the BMPs in Appendix H. While the alternatives are the same, and the management prescriptions are similar to those on the remainder of the district, they have been specifically designed for the area. For example, some treatments (e.g., precommercial and commercial thinnings and fertilization) are proposed for longer rotations in recognition that timber growth in that part of the planning area is slower.

As on the remainder of the district, the risk of incurring a higher level of adverse impacts on soils is greater under the Alternatives NA, A, and B which have more acres in the intensive management base. There would be less risk of adverse impacts in Alternatives C and the PRMP which would involve harvest of fewer acres, Alternative E which would harvest no FGR2 lands, and Alternatives D and the PRMP which would retain additional woody material onsite.

Effects on Water Resources

PRMP Relationship to the Final SEIS

The analyses and conclusions regarding water quality in the Final SEIS—as modified by the ROD and included with the Standards and Guidelines—have been incorporated into the Proposed Resource Management Plan (PRMP). The Final SEIS essentially adopted Option 9; it also concluded that the system of Riparian Reserves and other components of the Aquatic Conservation Strategy would have the least adverse effects to water quality and be expected to maintain or improve water resources.

Impacts of Management Allocations/Actions

A functioning ecosystems strategy (Aquatic Conservation Strategy), land allocations, and the PRMP Standards and Guidelines will be used—as described in Chapter 2—to restore and maintain the ecological health of watersheds on public lands. The watershed analysis, which will be done as part of the Aquatic Conservation Strategy on basins 20-200 square miles in size, will address entire watersheds and provide information that can be used in assessing environmental impacts for specific projects according to the National Environmental Policy Act. This watershed analysis is expected to provide a framework for maintaining ecosystems and providing a scientifically-based analysis for future projects. Transition watershed analysis in the next two years will follow the FY 1994-96 Regional Ecosystem Office (REO) Interagency Watershed Analysis Guidance. The full effect of these strategies, analyses, and allocations should provide heightened beneficial effects on the water resource and hydrologic functions, while allowing some activities on public lands.

Management allocations for major land-disturbing activities including timber production (matrix lands including General Forest Management Areas) would have the greatest potential for local or watershed-wide adverse effects on water resources. The most beneficial effects on water resources would be from allocations that protect streams, lakes, and other water sources (e.g., Riparian Reserves and administratively withdrawn timber production capability classification areas) and allocations that maintain watersheds in a hydrologically recovered state (e.g., Late-Successional Reserves and Connectivity/Diversity Blocks).

Management activities associated with timber production that could adversely affect water resources locally or on a watershed scale include road and landing construction and reconstruction, quarry development for road surfacing, timber harvest, ground based yarding and site preparation, and prescribed burning. Other management activities that could adversely affect water resources on district lands are off-highway-vehicle (OHV) use, facility construction, recreation use, mining, and grazing.

Effects of management actions on water resources are analyzed using information from the 10-year timber scenarios for Alternatives A, B, C, D, E, and the NA, and from the district inventory projections for the PRMP. Activities—especially forest management—proposed in these alternatives and the PRMP (as outlined in Chapter 2) would have the potential to adversely impact water resources. All alternatives would involve disturbance to vegetation and soils; this disturbance may affect stream morphology, water quality and quantity, timing, and watershed function. Impacts of the greatest concern are those that would adversely affect beneficial uses of water, especially municipal or domestic use and aquatic life.

Types of data used in analysis include harvest acres, miles of road construction by surface type, yarding systems, site preparation, prescribed burning, age classes of vegetation, and acres of riparian lands disturbed. Since all lands are included within connected drainage systems, the analysis of overall impacts to water resources needs to consider effects of timber management and other land-disturbing activities in a watershed regardless of ownership. Analysis of expected impacts from activities only on BLM-administered land and other public land may not satisfactorily describe watershed effects nor meet the requirements of the SEIS ROD and NEPA. Because of changes in fluctuating market conditions and or its proprietary nature, some information on harvest and road building scheduling and methods used, site preparation and burning, and other techniques employed by private timber companies and landowners in intermingled ownership watersheds with BLM-administered lands is difficult to obtain at times. Accordingly, differences between alternatives were estimated using the relative comparisons done at a watershed level—those based on photography or remotely sensed data as primary sources.

Evaluation of the alternatives in the Draft RMP/EIS was done using a relative watershed condition index (WCI) by comparing the potential overall change in the Analytical Watersheds (AWSs) to the current condition. Since then, the WCI has been dismissed as an analytical tool for several reasons. The information used in calculating the Draft RMP/EIS WCI analysis is out of date due to significant harvesting activities on private and industrial lands. Another reason for dropping the WCI was its difficultly for updating and forecasting land-disturbing activities on BLM-administered lands due to soft projections of potential sale quantities in the 10-year management scenario for the PRMP. Another reason is that watershed analysis, as described in the SEIS ROD, is perceived to be a more revealing assessment of current watershed condition and should provide a foundation for appropriate resource management decisions.

The BLM is required by NEPA to analyze all impacts upon water resources which includes direct, indirect, and cumulative effects in the short term and long term. For assessing effects on water resources, the short term was assumed to be 10 years and the long term was 200 years. Direct effects of an alternative are those that occur close in place and time to the management action. One example of a direct effect that may be associated with ground-disturbing activities is onsite soil loss and subsequent delivery of a portion of the soil to stream channels, potentially increasing stream filling or sedimentation. Indirect effects of an alternative would be those that occur offsite from the action or later in time. An example would be routing of introduced sediment down high gradient mountain channels to a low gradient downstream reach and settling in pools. Accelerated sediment delivery would affect beneficial uses; for example it would reduce useable fishery habitat.

Cumulative effects of an alternative on rivers and streams in western Oregon would be those that combine downstream from various site-specific activities in a watershed in such a way as to have a measurable impact. Cumulative effects usually occur offsite from the action, generally over a lower portion of a stream, and may persist over a longer period of time. An example of a downstream hydrologic cumulative effect is persistent temperature increases during the summer months attributed to lack of riparian shade in various areas of an upper watershed. These cumulative effects are an averaging, rather than a sum, of all impacts within the watershed. Flow (quantity of water) increases downstream dilute site-generated impacts, while effects of management activities on lakes and groundwater tend to be additive because their water quantity usually remains relatively constant. Cumulative impacts over time are usually additive and can include the effects of past, present, and reasonably foreseeable future actions. In many watersheds, impacts from timber management activities are short term due to the rapid growth of vegetation. Evaluation of the net cumulative impact in a watershed is difficult due to its complexity including parameter or function of concern, methods of measurement, variance over both time and space, and degree of effect.

Since all alternatives affect water through soil and vegetation-disturbing activities such as timber harvesting, road building, log hauling, and OHV use, the amount and nature of the activity was used as an indicator of the risk of direct and indirect water resource impacts. Streams that currently show evidence of degradation (e.g., pools filling with sediment or a channel becoming either more eroded or wider) may be of higher future risk depending on the selected alternative. The NA Alternative and A and B would harvest more acres of timber and have more acres in new roads than other alternatives, giving them greater potential than the other four alternatives for impacting water resources. The potential effects of these three alternatives would be more focused at the sub-watershed level. Alternatives C, D, and E would have fewer acres of timber harvest, fewer acres in new roads, and varying levels of timber harvest intensity. The PRMP would have the least acres of timber harvest and other disturbance (see Chapter 4, Timber).

The intensity and duration of impacts on water resources in a watershed vary in relation to a watershed's condition and sensitivity. Primarily, however, impacts to water resources are related to the following: stream channel condition; large woody debris; water quality and quantity; upland conditions including distribution of harvest and acres disturbed; and overall watershed condition in the AWS. The impacts which are discussed individually below vary due to actions of the various alternatives and include estimated reasonably foreseeable actions on non-BLM-administered lands. The degree of impact on water resources would be relative to the existing conditions in AWSs identified in Chapter 3.

Impacts to Stream Channel Condition and Riparian Areas

Stream channel condition refers to the state of a stream or river system and its bed, banks, floodplain and riparian influence area. Stream channel stability is a measure of condition relative to its equilibrium.

A comparison is usually made to a non-erosive, well-functioning stream or an undisturbed stream in the same regional area. Some streams may be naturally unstable and have fair-poor stability ratings or may be adversely affected by management practices. Important processes expected to negatively affect channel condition throughout the planning area are: landsliding into channels and debris torrents, increases in peak flows, increases in sediment, removal of streamside vegetation, reduced bank stability, changes in stream structure from removal of coarse woody debris needed for effective energy dissipation, and changes in stream hydraulics such as channel straightening.

Relative changes in stream channel stability are illustrated in Table 4-4 for the analytical watersheds in the planning area where BLM administers a substantial portion of the watershed. The baseline condition has been determined through district surveys and field observations done by resource specialists and by observations of streams on private lands. Relative change by alternatives reflects potential impact to the stream's condition and change in state. Successful implementation of the Best Management Practices (BMPs) and Management Direction Common to All Alternatives (Appendix H and Chapter 2) would minimize or eliminate negative impacts to stream channels on BLM-administered lands. Private lands' contribution to adverse impacts to stream channel condition is expected to decrease if the Oregon Forest Practice Act's revised water classification and protection rules are successfully implemented.

Alternatives C, D, and E would result in a net long-term improvement in stream channel condition (improved stability) and fish habitat in Lower Smith River, Loon Lake/Camp Creek, Middle Umpqua Frontal, and South Fork Coos AWSs. The predicted net improvement relates to less acres of expected streamside disturbance, fewer roads, less yarding disturbance, more acres of riparian mid-late seral vegetation providing shade, energy dissipation by log steps in high gradient channels, bank stability, and an effective filter strip to reduce sediment input.

The provision under Alternatives A, B, C, and D for Riparian Management Areas (RMAs) along all perennial streams on BLM-administered lands would help to maintain channel integrity, allowing the RMAs along most perennial streams to improve functioning and also providing future coarse woody debris. Lack of RMAs along first and second order intermittent stream channels under Alternatives A, B, C, and D would remove a future source of large coniferous coarse woody debris and result in these streams being more susceptible to functioning at risk or non-functioning. RMAs along all stream channels in Alternative E would improve the functioning of stream sand provide a source of coarse woody debris.

In AWSs where the BLM administers a minor portion of the watershed, RMAs would neither offset the loss of riparian areas on private lands nor substitute for channel system recovery where loss of channel diversity (e.g., pool to riffle ratio, variety of sizes of bed and bank materials, large wood component, and limited bank erosion) has already occurred. For example, in the Chetco River AWS where the BLM administers only five percent of the watershed, the Chetco River has lost most of its channel functioning as a result of past logging practices and ongoing gravel extraction operations. Even where BLM administers a minor percentage of a stream, however, the value of BLM riparian areas is still important for site-specific physical, chemical, and biological channel needs.

The Riparian Reserves allocation in the PRMP would protect all perennial and intermittent streams on BLM-administered land. The Riparian Reserves widths vary by duration of streamflow, site characteristics, and fish/non-fish bearing status, but are generally wider than RMAs in other alternatives and surround all defined channels. This allocation would protect the existing stream channel condition in the short term, and in the long term assist recovery and proper functioning of degraded stream systems.

Large woody debris management by alternative would be directly affected by the condition of the riparian vegetation (see Appendix III-B in the draft RMP, and the Riparian and Fisheries sections of this chapter). The amount, species, size, distribution, and effectiveness of large woody debris retained under the various alternatives would partly determine the proper functioning of streams and rivers. A study of streams in the Coast Range found that 90 percent of large wood in channels originated within 92 feet of the stream (McDade et al. 1989).

In the long term, timber grown in the RMAs and Riparian Reserves would replace large woody debris removed by past practices, floods, or natural decomposition and result in a net improvement. This material would come from existing conifers and some hardwood tree species that are preserved, released, or intentionally grown in the riparian area. Retention of large woody debris would continue to provide habitat for aquatic organisms, regulate flow, reduce flooding, maintain low flows, reduce erosion, and trap sediment.

Table 4-4. Expected Changes in Stream Channel Stability for Analytical Watersheds [1]

	Alternative						
Analytical Watershed [2]	**PRMP**	**NA**	**A**	**B**	**C**	**D**	**E**
Lower Smith River	+	0	0	0	+	+	+
Lower Umpqua Frontal	+	0	0	0	0	0	0
Loon Lake-Camp Creek	+	-	-	-	+	+	+
Middle Umpqua Frontal	+	+	+	+	+	+	+
South Fork Coos	0	0	-	0	+	+	+
East Fork Coquille	0	-	-	-	0	0	0
Middle Fork Coquille	0	-	-	-	0	0	0
North Fork Coquille	+	-	-	-	0	0	0
Humbug-Nesika Frontal	0	-	-	-	-	0	0
Hunter Creek	0	0	0	0	0	0	0

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[1] Eighteen additional district analytical watersheds have less than 10 percent BLM-administration, but cannot reasonably be evaluated in context with non-BLM-administration.

[2] Watersheds on planning area where BLM has at least 20 percent administration.

Abbreviations used in this table:

- - = Decreasing stream stability expected.
- + = Increasing stream stability expected.
- 0 = No change in stream stability expected.

Successful implementation of the BMPs would prevent any significant short-term changes in the distribution or amount of large woody debris in BLM streams, except for a decrease in first and second order streams under Alternatives NA, A, B, C, and D (first order only). Under the PRMP, Riparian Reserves would afford protection and restoration in the short term, showing a net improvement in large woody debris recruitment. A long-term effect would be decreased large woody debris in first and second order intermittent streams in all AWSs under Alternatives NA, A, and B. This future loss would be less under Alternatives C. Under Alternative D, these impacts would occur in first order intermittent streams only. Alternative E and the PRMP would provide future large woody debris in all streams.

By retaining a specified number of trees per acre, Alternative C would provide a future source of large woody debris. Alternative E would protect the integrity of RMAs by establishment of a "no-planned harvest" in RMAs of all first and second order streams. A similar long-term gain of large woody debris on second order intermittent streams would be expected under Alternative D, where a "no-planned harvest" in RMAs would lead to improvement. For the purpose of conducting analysis at the watershed level, it is assumed there would be very little riparian protection of first and second order streams on private lands, and these streams would continue to be deficient in large wood. If the OFPA's revised water classification and protection rules are followed on non-BLM lands, the long-term large woody debris recruitment would increase in streams that are lacking and decrease on riparian lands that have an abundant supply. The effect of all ownerships, however, would probably be a net increase in large woody debris because of the current deficit of this debris in the district watersheds.

The type, distribution, age, and condition of riparian vegetation affects many aspects of stream channel function. The Riparian section of this chapter rates the riparian condition for each stream order by alternative.

Impacts to Water Quality and Quantity

Water resource parameters most commonly associated with forest management in western Oregon include changes in streamflow and yield, sedimentation, water temperature, instream structure or large woody debris (as discussed above), and introduced chemicals.

Some temporary changes in water quality may occur under all alternatives in varying degrees. State water quality standards and criteria, however, are expected to be met due to BMPs being site specific, correctly designed, implemented, and evaluated, and also because high quality waters will be maintained. The district's water quality management will be consistent with the Memorandum of Understanding with Oregon State Department of Environmental Quality's (DEQ), Non-Point Source Pollution Management Plan (based on the 1988 Assessment), and DEQ's bi-annual 305b report.

Water temperature is directly affected by solar radiation reaching the stream. Riparian vegetation prevents increases in water temperature by providing effective shade (Brown 1980, Brown et al. 1971). Because one objective of the RMAs and Riparian Reserves for all alternatives includes providing effective shade on perennial streams, the water temperatures are not expected to vary between the alternatives on BLM-administered lands.

Sediment pollution is identified for many stream segments in the 1988 Oregon Statewide Assessment of Non-Point Sources of Water Pollution in Oregon's Mid Coast, Umpqua, and South Coast Basins, which include the district's AWSs (see Table III-D-l in Appendix D of the draft RMP). These problem ratings include at least one stream in most AWSs with a moderate sedimentation level, but only one at a severe level (Euchre Creek in the Humbug Nesika-Frontal AWS). Stream sedimentation is associated with ground-disturbing activities (e.g., timber harvest, road construction, log hauling, and OHV use).

Successful implementation of site-specific BMPs would limit onsite soil loss and sediment delivery to streams. Alternatives NA, A, and B—which would have more intensive timber management—would have the highest potential risk of increased stream sediment. Factors for this basis include the lack of streamside buffers on first and second order intermittent streams (allowing pathways for sediment delivery), and the correlation between acres of soil disturbance and compaction (allowing changes in timing of runoff including potential peak flow increases). Soil disturbance would provide a sediment source (if BMPs have not been correctly applied or are not effective). Lack of effective riparian areas on first and second order streams would accelerate sediment delivery, while the peak flow increases would accelerate channel scour.

The different harvest intensities between Alternatives C and D would produce smaller, varying amounts of sediment from ground disturbance and have less potential for peak flow increases. Alternative E and the PRMP would have the lowest potential risk of producing sediment because their wide RMAs and Riparian Reserves reduce sediment delivery to streams by maintaining few routes of entry. Most onsite soil loss (excepting some landslides and debris torrents) would be redistributed on the hillslopes and not enter stream channels.

All alternatives would similarly affect other natural water quality parameters including pH, dissolved oxygen, and nutrients. While these parameters vary during times of seasonal streamflow, significant trends have not been observed when riparian-dependent resources are addressed. Chemical applications will be in conformance with the FEIS and ROD for Western Oregon Program-Management of Competing Vegetation (Appendix I-C in the draft RMP).

Fertilization of timber stands for accelerated growth was analyzed as an ongoing district activity. The alternatives should not incur measurable differences in water quality due to the use of fertilizers if BMPs are designed to be site-specific, are implemented correctly, and are effective.

Several small placer operations are either active or under development on the district. These prospects, located within the Sixes River and Hunter Creek analytical watersheds, show some gold and nickel/cobalt values. The 5 to 7 additional Notices of Intent expected for mineral exploration and possible development spanning the plan period will be guided in their design by NEPA analysis, an APD or Plan of Operations, and site-specific BMPs including reclamation (see Effects on Minerals Resources in this chapter.) Considering these various protection measures, no significant effects on water resources are expected from the limited mineral development under any alternative and the PRMP.

Annual water yield is not expected to change under any of the alternatives, including the PRMP, except slightly in coastal lowlands of which there are less than 10,000 acres in the district. Research on streamflow in western Oregon—not including dominant fog drip areas—has concluded that annual water yield response to sustained timber harvest in larger watersheds similar to the AWS is less than the accuracy of streamflow measurements (Harr, Fredrikson and Rothacher 1979; Harr 1976). In coastal areas of the district where a fog zone extends 3 to 10 miles inland, fog interception and drip may account for up to 30 percent of the precipitation. When timber is harvested in these areas, reductions in precipitation may actually be enough to offset transpiration losses, and annual yield may slightly decrease (Harr 1983). However, this effect is temporary and could not be reasonably measured between alternatives.

Winter peak flow increases can occur in response to compaction or rapid melt of shallow snowpack in the watershed. Peak flow increases during medium-to-high flows may be affected according to the varying amount of disturbance under each alternative. The dominant streamflow for a given storm size may increase; however, forest management activities have little effect on the size of large, wet mantle floods.

Research has shown that peak flow increases can occur in response to soil compaction when the impacted area represents at least 13 percent of a small watershed (Harr 1979). One method to assess the risk and effects of peak flow increase for an alternative would be knowing the current channel condition and percent of watershed area compacted. Greater flows would adversely affect channel stability, fish and aquatic habitat, and roads and facilities in the floodplain.

Peak flow increases have been observed in the transient snow zone (about 1,800 feet and higher for the district) when the forest canopy is removed (Harr 1981, Harris and Harr 1983, Harr 1986). Snow accumulates faster in openings than in the surrounding forest. In harvested areas where the forest canopy has been reduced to less than about 70 percent, this increased snow depth is available for quick melt and runoff when driven by warm and windy rainstorms. This extra water enters the soil and moves to the channels as increased flood flow. Although the snow-melt mechanism is not completely understood, the evaluation of a watershed's susceptibility to rain-on-snow storms would help determine the hydrologic condition and potential risk of flow increases. As less than 15 percent of the district's landbase is within the transient snow accumulation zone and limited portions of individual sub-watersheds, additional flow from rapid snow-melt would be a minor factor in peak flow increases.

The risk of potential impacts on channel condition from peak flow increases would vary among the alternatives. In the short term, Alternative E and the PRMP would have the lowest risk. Alternative C which provides for retention of a portion of the basal area would be expected to have less risk than Alternatives NA, A, or B. The range of management allowed in Alternatives D may lessen the potential for peak flow increases, including no planned timber harvest in Habitat Conservation Areas (HCAs).

Large watershed area allocations—including Late-Successional Reserves and Riparian Reserves of hydrologically mature forest in the PRMP—would reduce potential for peak flow increases.

Under all alternatives in the long term, there would be recovery of most sub-watersheds that are now at a reduced level of hydrologic condition, and are either exhibiting peak flow impacts in the channels or are at risk.

Reduced streamflows, by 25 percent in late summer, have been shown to occur 8 years following harvest (including riparian harvest) in small coastal watersheds after increased streamflows in early years (Hicks, Beschta, and Harr 1991). This decrease in low flow is thought to be the result of replacement of conifer forest stands with hardwood species. In all alternatives including the PRMP, the RMA and Riparian Reserve allocations would lessen the risk of planned riparian harvest along perennial streams. There may be a tendency for lower summer flows on the many district watersheds with streams where existing riparian hardwood dominated stands have replaced largely coniferous stands from past riparian harvest or fire. This effect cannot be reasonably measured, however, because its magnitude, duration and extent are unknown. No other measurable changes in low flows are anticipated for the various alternatives and the PRMP.

Neither the quality or quantity of groundwater is expected to be affected by any of the alternatives or management practices described in Chapter 2. District geology prevents much groundwater accumulation other than in shallow river alluvial aquifers or in the coastal dune-field aquifer that extends 2.5 to 5 miles inland north of Coos Bay in the Coos Bay North and Lakeside Frontal AWSs. Soils should effectively filter potential pollutants and prevent them from entering groundwater aquifers. Activities that significantly decrease soil infiltration—such as road construction—would site-specifically alter the amount and/or location of surface/subsurface flow reaching groundwater. Changes in groundwater quantity, however, would be far too small to reasonably measure under any alternative and the PRMP.

Impacts to the Upland Condition

Maintenance and improvement of upland conditions on BLM-administered lands would take place as individual and collective conservation practices contributing to a site-specific BMP project design for a given activity are implemented, evaluated, and become refined through monitoring feedback and improvement of control methods. For example, uplands would benefit from improved technology and increased ability to delineate hazards (e.g., peak flows in unguaged watersheds and steep unstable terrain). Through implementation of BMPs, BLM would prevent or minimize the loss of long-term soil productivity and also the degradation of upslope lands (see Effects on Soils).

Table 4-5 shows subwatersheds within AWSs where harvests are planned based on the representative 10-year timber management scenario. Scheduling over space and time, or deferral of harvest, may be necessary in these subwatershed areas if a probable cumulative effect is demonstrated by analysis of planned timber harvests in a sub-basin area of the AWS. Such scheduling or deferral would continue until satisfactory hydrologic basin recovery is attained. Potential watershed cumulative effects needing evaluation would most likely be restricted to sedimentation of streams, increases in stream temperatures, changes in channel morphology, decreases in low streamflows, and potential increases in peak flows.

Overall upslope conditions in AWSs in the short term would be less affected under Alternatives C, D, and E than under Alternatives NA, A, and B due to differing intensities in timber harvest and road construction. Alternative PRMP would have fewer probable acres harvested but more road construction than Alternatives C, D, and E. Riparian Reserve allocations planned for the PRMP would considerably reduce upland effects of activities including sediment delivery, temperature increases, and changes in channel structure on BLM-administered lands. Watershed analysis done as part of the Aquatic Conservation Strategy under the PRMP would best address the upland condition on a watershed scale; it would maintain or improve the upland and overall land condition by identifying management interpretations including restoration and cumulative effects analysis for project planning. Upland conditions would improve over the long term on those portions of AWSs within HCAs in Alternative D and on Late-Successional Reserves and Riparian Reserves in the PRMP.

Impacts to Overall Watershed Condition

The projected change in general watershed condition for the Lower Smith River and South Fork Coos

Table 4-5. Sub-Watersheds Where Harvest Emphasis Would Occur Based on 10-Year Scenario by Alternative

Analytical Watershed & Sub-Watershed	PRMP [2]	Alternatives [1]				
		A	B	C	D	E
Lower Smith River						
Wassen Creek		X	X			
Little Mill Creek		X				
Johnson Creek		X	X			
Spencer Creek			X			
Buck Creek			X			
West Fork Smith River			X			X
Middle Umpqua Frontal						
Lutsinger Creek				X		X
Loon Lake/Camp Creek						
Little Camp Creek				X	X	
Sock Creek					X	
Tom Fool Creek					X	
South Fork Coos						
Cox Creek		X	X			
Burma Creek		X				
Coal Creek		X	X			
Mink Creek		X				
Hatcher Creek		X				
Hog Ranch Creek		X				
North Fork Coquille						
Middle Creek		X			X	
Vaughn's Creek		X			X	
Park Creek		X			X	
Alder Creek		X	X		X	
Moon Creek		X	X		X	
Little Cherry Creek			X			
Fruin Creek			X			
East Fork Coquille						
China Creek		X				
Brummit Creek		X	X			X
Dead Horse Creek		X				
Elk Creek	X			X		
Middle Fork Coquille						
Big Creek	X			X	X	X
Fall Creek	X			X		
Rasler Creek	X			X		X
Indian Creek				X		X
Sandy Creek	X				X	X
Rock Creek	X				X	

Table 4-5. Sub-Watersheds Where Harvest Emphasis Would Occur Based on 10-Year Scenario by Alternative (continued)

Analytical Watershed & Sub-Watershed	PRMP [2]	Alternatives [1]				
		A	B	C	D	E
Lower Umpqua Frontal						
Tom Folly Creek			X			
Coal Creek			X			
Little Mill Creek			X	X		
South Fork Coquille						
Rowland Creek			X			X
Baker Creek			X			X
Humbug-Nesika						
Euchre Creek		X			X	
Brush Creek		X			X	
Hunter Creek						
Conn Creek		X				
Hunter Creek		X				
North Fork Creek		X				
Pistol River						
Deep Creek						X
Chetco River						
Bravo Creek				X	X	X
N. Fork Chetco				X	X	X
Ransom Creek					X	

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[1] The No Action Alternative is not included; no 10-year scenario done for NA.

[2] Based on district forest inventory projections and distribution, not the 10-year scenario.

River AWSs would show gradual improvement under Alternatives C, D, E, and the PRMP. There would be little change from the current condition under Alternatives A and B. The anticipated watershed condition improvement in these two watersheds is based upon partial recovery of soil disturbance from past logging, vegetative transition from younger to older age classes, some regrowth of riparian vegetation on private lands, and relatively few harvest acres proposed for the size of the AWSs on both BLM-administered lands and other ownerships.

The Middle Umpqua Frontal AWS showed similar levels of watershed improvement under all alternatives, but greatest under C, D, E, and the PRMP. The basis for projecting these improved watershed conditions was analysis of hydrologic recovery in terms of soil and vegetation factors, low acreage of new roads and other disturbance, and fewer acres of probable BLM and non-BLM harvest likely for the decade.

Loon Lake/Camp Creek and North Fork Coquille AWSs would essentially not change in Alternatives C, D, and E; they would improve in the PRMP; and they would be in a declining condition in Alternatives A and B. The partial recovery of soil disturbance from past logging and the vegetative recovery in uplands and riparian areas would be offset by new harvest and show a static-to-declining trend under all alternatives except the PRMP. General watershed improvement in the PRMP is predicted due to application of Riparian Reserves allocation, improvement of riparian and channel conditions, less than 20 percent of the watershed being in young forest age classes at any one time, and planned watershed restoration.

The Middle Fork Coquille and East Fork Coquille AWSs would have a declining watershed condition under Alternatives A, B, C, D, and E. Under the PRMP, watershed condition for these two AWSs would range from no change to potentially declining, depending on the distribution and timing of harvest. Partial recovery of soil disturbance from past logging, the transition of some vegetation from younger to older age classes, and moderate regrowth of riparian vegetation would be offset by acres of proposed new harvest on BLM-administered lands and other ownerships contributing to the declining condition. A net effect of no change to possibly declining is expected in some subwatersheds of these AWSs under the PRMP due to its lower probable harvest, pattern of Riparian Reserves on federal land, planned watershed restoration, and some regrowth of forest vegetation that would allow partial hydrologic recovery. Watershed analysis under the PRMP will provide information—considering BLM planned actions—to plan timber harvest and other activities in subwatersheds to either preclude changing watershed conditions or to make improvements.

Analysis of the Middle Fork Coquille AWS for the PRMP included possible harvest of 3,000 acres of land in the Coos Bay and Roseburg BLM districts, and 33,000 acres of non-BLM-administered lands for the decade. On non-Federal lands, it was estimated that 50 percent of the mature timber would be harvested within the 10-year plan period. The analysis considered that some timber harvest may have already occurred. About 9,000 acres (5 percent of the AWS) would be in the 0-to-3 years forest age class at any one time, and approximately 25 percent of the watersheds' forest would be under 20 years old. The increased harvest emphasis over the watershed, including non-BLM actions, would increase soil disturbance. New roads (including BLM and non-BLM) constructed under Alternatives A, B, C, and the PRMP would affect 1,800 acres or one percent of the AWS. Assuming that current State Forest Practices Act streamside rules are followed, non-BLM forest landowners could potentially harvest about 900 acres of riparian lands along perennial streams.

A summary of overall watershed condition for BLM-administered and non-BLM-administered land is provided on Table 4-6. This summary lists the number of analytical watersheds that would or may have improved conditions, those with unchanging conditions, and those where conditions would or may decline.

Conclusion

Implementation of the Best Management Practices and allocations including Riparian Management Areas or Riparian Reserves under all alternatives will greatly reduce potential adverse effects of management activities on water resources. BMPs will be refined and adjusted as necessary, based on monitoring results. This refinement and adjustment is intended to ensure that water resources meet Oregon's water quality numerical and narrative standards and criteria and its antidegradation policy. Application of the Aquatic Conservation Strategy objectives and components—including Riparian Reserves, Key Watersheds, Watershed Analysis and Watershed Restoration—would largely minimize adverse effects to soil and water on BLM-administered lands for the Proposed Resource Management Plan. Pollution sources will not be totally eliminated, however, because of the poor

Table 4-6. Summary of Overall Watershed Condition for BLM-Administered and Non-BLM-Administered Lands

		Alternative[1]				
	PRMP	A	B	C	D	E
Number of Analytical Watersheds in Which Conditions Would Improve	5	1	1	3	3	3
Number of Analytical Watersheds in Which Conditions May Improve	0	0	1	0	2	1
Number of Analytical Watersheds in Which Conditions Do Not Change	2[2]	2	1	2	0	1
Number of Analytical Watersheds in Which Conditions May Decline	0	0	1	0	0	0
Number of Analytical Watersheds in Which Conditions Would Decline	0	4	3	2	2	2

[1] NA not included; no 10-year scenario done for NA.

[2] Uncertain without watershed analysis by subwatershed of selected AWS.

current condition of some watersheds, the distribution of harvest and road building areas in the watershed, the effects of forestry and agricultural activities from private lands, and variable compliance monitoring.

The risk of short-term adverse effects on water quality would be highest under Alternatives A and B. Management activities under these alternatives could increase levels of turbidity, sediment, temperature, and peak flow and could reduce channel structure in first and second order channels. These increases have the potential for not complying with State water quality standards. The risk of noncompliance with State water quality standards would be similarly moderate-to-high for the NA Alternative. Because of the moderate-to-low risk of increases in turbidity, sediment, temperature, and peak flow from management actions, Alternatives C, D, E, and the PRMP would be expected to meet State water quality standards. The PRMP will also achieve the Aquatic Conservation Strategy objectives.

Potential cumulative effects differ among the alternatives, excepting the PRMP, primarily as a function of the alternatives' proposed level of land disturbance, existing watershed condition, and distribution within watersheds of lands available for harvest. Broad scale application of the Aquatic Conservation Strategy in the PRMP will significantly reduce the potential of demonstrated cumulative effects to water resources compared with the alternatives.

In the long term, the relative effects of the alternatives would be similar to, or improving from, those described for the short term.

Riparian and watershed restoration activities proposed under Alternatives D, E, and the PRMP would improve long-term water quality and watershed condition. Principal benefits are: reduction of sediment delivery to streams, stabilization of stream channels and failing streambanks, correction of eroding or unstable roads, increased shade vegetation on streams and improved riparian condition, and establishment of vegetative cover on disturbed sites. Water quality would be maintained in the short term, and likely improved in the long term, in areas unavailable for timber harvest and restricted from surface-disturbing activities.

Effects on Biological Diversity (Including Forest/Ecological Health)

Effects on Biological Diversity

This section focuses on the impacts of alternatives on biological diversity. For purposes of this analysis, biological diversity has been divided into the following components: genetic diversity, species diversity, ecosystem and stand diversity, and landscape diversity. Since it is difficult to conclude that any one specific measure of biodiversity is the best index for comparison between alternatives, a number of indicators of diversity have been selected for analysis. These indicators include: acres of habitat (e.g., old and early-seral stages, hardwoods, special habitats, riparian zones, and research natural areas), the abundance of snags and wildlife trees, the amount of dead and down wood, genetic diversity, and fragmentation of older forest habitat (as measured by the size and spatial arrangement of older forest blocks). Effects of plan alternatives on biological diversity are also related to impacts on special status animals and plants, particularly threatened and endangered species. The expected short- and long-term changes (compared to current conditions) in these indicators under the various alternatives are shown in Tables 4-7 and 4-8. For a more indepth analysis of special status species, refer to the Wildlife and Special Status Species sections of this chapter.

Major activities affecting biological diversity on BLM-administered lands include timber harvest and reforestation practices. Analysis of these impacts on components of biological diversity is uncertain. This is because biological diversity has not been intensively studied, and the concept is just beginning to be applied in management. Although the baseline used in this assessment of impacts is the existing situation, biological diversity can only be defined in the historic context of natural disturbances such as wildfire, windstorms, and human impacts. Human activities have been affecting the ecosystems of western Oregon for thousands of years, but those effects have escalated substantially in the last 140 years as described in Chapter 3.

Lands allocated for timber production would be managed for commercial conifers under Alternatives NA, A and B. Reforestation in all alternatives would be accomplished primarily through plantings of Douglas-fir and other species, although a greater variety of species would be planted under C and the PRMP. Vegetation management would subsequently be used under all alternatives (least under Alternatives D and E) to suppress competing vegetation (e.g., red alder, vine maple, tan oak, and salmonberry) where necessary and favor the planted species. Prescribed burning after logging would be conducted under all alternatives and would affect the structure and composition of upland vegetation communities (Halpern 1987). Some of the burning under the PRMP is expected to be underburning. Burning would reduce the amount of woody debris, kill or destroy some retained trees, inhibit the growth of some residual vegetation, and promote the growth of invader species. Gradual recovery would occur over time. The rate of recovery would be highly variable depending on the method of timber harvest, intensity of burn, site condition, and the composition of the original vegetation. The amount of prescribed burning would be greater under Alternatives NA, A, and B than under C, D, E, or the PRMP. Burning impacts would usually be limited to the short term.

Genetic Diversity

Impact analyses of silvicultural practices on the genetic diversity of commercial tree species have provided conflicting results (Millar et al. 1990). In the short term, genetic diversity is expected to be similar under all alternatives. The lack of consistent information, however, prevents firm conclusions concerning these impacts within the planning area. Given the nature of sexual reproduction, it is unlikely that silvicultural practices would cause a loss of genetic diversity in a species.

Genetic diversity refers to the amount of variation within a species. When new generations are the result of sexual reproduction, all offspring are genetically different. While sharing common genes, the individuals combine genes differently which makes each individual genetically diverse from all other individuals.

Tree selection and breeding programs are designed to prevent excessive narrowing of gene pools or the complete loss of genetic traits. Moreover, genetic selection may provide the only viable method of protecting genetic material in species whose existence is threatened by plant diseases, such as the white pine blister rust.

Intensive forest management practices in Alternatives NA, A, and B could lead to the isolation

Table 4-7. Changes in Components of Biological Diversity in the Short Term (10 years) by Alternative

	Alternatives						
Aspect of Biological Diversity	**PRMP**	**NA**	**A**	**B**	**C**	**D**	**E**
Special Status Animals	0	-	-	-	0	0	0
Special Status Plants	0	0	0	0	0	0	0
Older Forest (Open Canopy)	0	-	-	-	+	+	+
Early-Seral Stage	-	+	+	+	-	-	-
Late-Seral Stage	+	-	-	-	+	+	+
Special Habitats (e.g., talus slopes and meadows)	+	-	-	-	+	+	+
Hardwoods	+	-	-	-	+	+	+
Riparian Zones	+	-	-	-	0	+	+
Research Natural Areas	0	0	0	0	+	+	0
Snags/Wildlife Trees	-	-	-	-	-	-	-
Dead and Down Material	0	-	-	-	-	-	-
Fragmentation of Older Forest	0	-	-	-	0	0	0

Abbreviations used in this table:
+ = Improving/increasing
0 = Maintaining
- = Declining

Table 4-8 . Changes in Components of Biological Diversity in the Long Term (100 years) by Alternative

	Alternatives						
Aspect of Biological Diversity	PRMP	NA	A	B	C	D	E
Special Status Animals	+	-	-	-	+	+	+
Special Status Plants	0	-	-	-	0	0	0
Older Forest (Open Canopy)	+	-	-	-	+	+	+
Early-Seral Stage	-	+	+	+	-	-	-
Late-Seral Stage	+	-	-	-	+	+	+
Special Habitats (talus, meadows)	+	-	-	-	+	+	+
Hardwoods	+	-	-	-	+	+	+
Riparian Zones	+	-	-	+	+	+	+
Research Natural Areas	0	0	0	0	+	+	0
Snags/Wildlife Trees	+	-	-	-	+	+	+
Dead and Down Material	+	-	-	-	+	+	+
Fragmentation of Older Forest	+	-	-	-	+	+	+

Abbreviations used in this table:

+ = Improving/increasing
0 = Maintaining
- = Declining

of some wildlife populations (e.g., some amphibians and the northern spotted owl) as a result of habitat loss. This isolation could potentially induce inbreeding resulting in loss of genetic diversity and vitality, and an increased chance of extinction (Lande 1985). Similar isolation effects have been noted for plants.

Effects of planting genetically superior stock are discussed in the Effects on Timber Resources section. Appendix L contains a discussion of BLM's tree improvement program and genetic diversity.

Species Diversity

Timber management directly affects plant and animal species diversity. Plant species diversity (richness)—as measured by number of species and relative percentage of ground cover of individual species (evenness)—declines immediately following harvest of old-growth stands. However, it then increases and peaks between 15-20 years (Schoonmaker and McKee 1988). Some of this high diversity in early stages is due to the presence of non-native species.

This early high diversity is generally short-lived in most managed and natural stands. Following closure of the tree canopy (usually 20-30 years), plant species diversity declines to its lowest level before slowly recovering again in mature and old-growth stages to levels intermediate between early-seral and closed-canopy stages. However, species evenness is highest in old-growth stands which indicates that cover of individual plants is more evenly distributed relative to each other (i.e., stands are not as dominated by a few species as in early-seral stages).

In the long term, Alternatives C, D, E and the PRMP would have the most acres in mature and old-growth stages. Alternative C and the PRMP would have the least acres in the early-seral stage and closed-canopy stages. In contrast, Alternatives A and B would have the most acres in the earlier seral stages and the least in mature and old-growth stages. Figures 4-2 (short term) and 4-3 (long term) and Tables 4-9 and 4-10 show the project acres by seral stage for each alternative. Alternative C would encourage plant species diversity in mid- and late-seral stages by providing more open-canopy conditions. Data from Schoonmaker and McKee (1988) suggest that timber management would not substantially diminish the high level of plant species diversity in the early seral stage. However, in all alternatives except C and the PRMP, timber management would likely accelerate succession. This would shorten the time in the early seral stage when that high level of diversity prevails.

Although some bryophytes, lichens, and fungi species are present in younger stands, they reach their greatest diversity and abundance in late-seral stages. In the short term, the diversity of these species is expected to remain the same under all alternatives. In the long term, Alternatives C, D, E, and the PRMP would have the most acreages in older forests, which would provide a higher diversity for bryophytes, lichens, and fungi. For additional information on these species, refer to the SEIS Special Attention section.

Wildlife species diversity follows a slightly different pattern than observed for plants. For example, early-seral stages and old-growth provide primary habitat for a similar number of wildlife species (76 and 80 respectively); and closed-canopy, pole timber stands provide substantially fewer species (58). (See Chapter 3 Wildlife.) Accordingly, on a landscape level, wildlife species diversity is greatest when the forest is dominated by a mix of old-growth/mature and early-successional stages. If the mix includes some large, interior older forest patches, it favors forest interior species and those adapted to edge habitats (Logan et al. 1985). Bruce et al. (1985) showed that the early seral stage provides feeding habitat for the most number of animal species, while mature and old-growth forests provide breeding habitat for the most species.

Species that prefer early successional habitats are habitat generalists. They have evolved characteristics which enable them to survive in these rather fleeting environments. These characteristics include: rapid population growth, wide dispersal capacity, and relative flexibility in habitat requirements. Old-growth related species, which are adapted to a more stable habitat, tend to be specialists that often have relatively slow population growth rates and poor dispersal capabilities (Crow 1990). Alternatives that maintain or increase old growth would benefit species diversity more than those that maintain or increase the early-seral stage. This is because the habitat of relatively inflexible old-growth specialists would be mantained.

Models of vertebrate species response to habitat fragmentation show that species diversity would begin to decline when 50-75 percent of the landscape is cutover under a harvest rotation system that does not allow for the development of late successional forests (Lehmkuhl et al. 1991). A vulnerability analysis of 93 species associated with

Table 4-9. Forest Seral Stages Short Term (10 Years)

Seral Stage (Age)	Acres by Alternative (1,000)							
	Existing	PRMP	NA	A	B	C	D	E
Early (0-10)	63	16	66	79	79	43	41	49
Mid (20-30)	83	100	90	92	90	91	90	91
Late (40-80)	49	79	70	70	71	68	68	61
Mature (90-190)	66	59	43	65	51	55	56	52
Old-growth (200 +)	48	55	40	3	18	52	54	56

Table 4-10. Forest Seral Stages in the Long Term (100 Years)

Seral Stage (Age)	Acres by Alternative (1,000)							
	Existing	PRMP	NA	A	B	C	D	E
Early (0-10)	63	10	30	70	84	11	45	31
Mid (20-30)	83	11	69	117	110	23	52	56
Late (40-80)	49	25	133	86	58	43	70	43
Mature (90-190)	66	164	16	22	28	167	71	98
Old-growth (200 +)	48	99	61	14	29	65	71	81

Figure 4-2. Forest Seral Stages Short Term (10 Years)

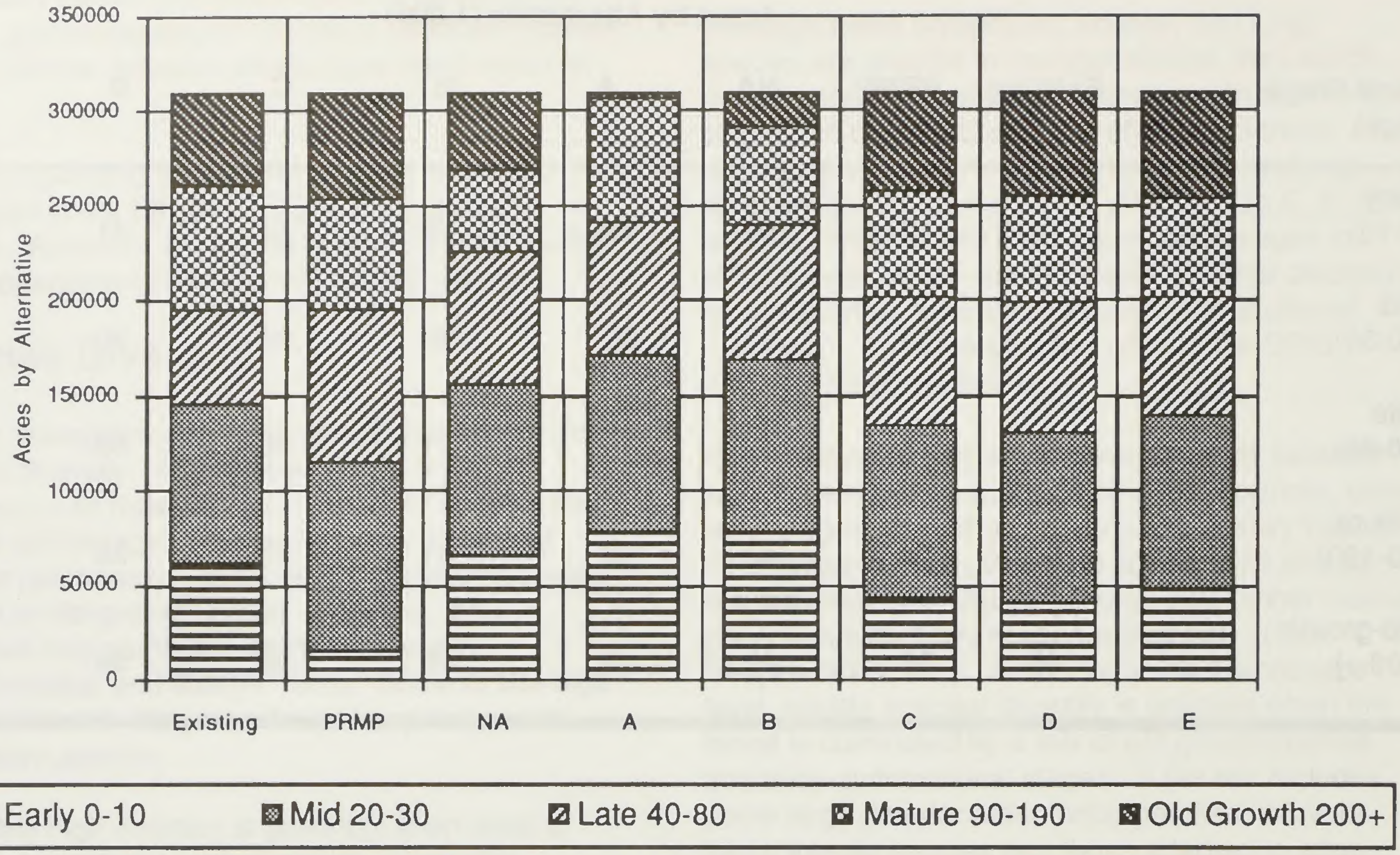
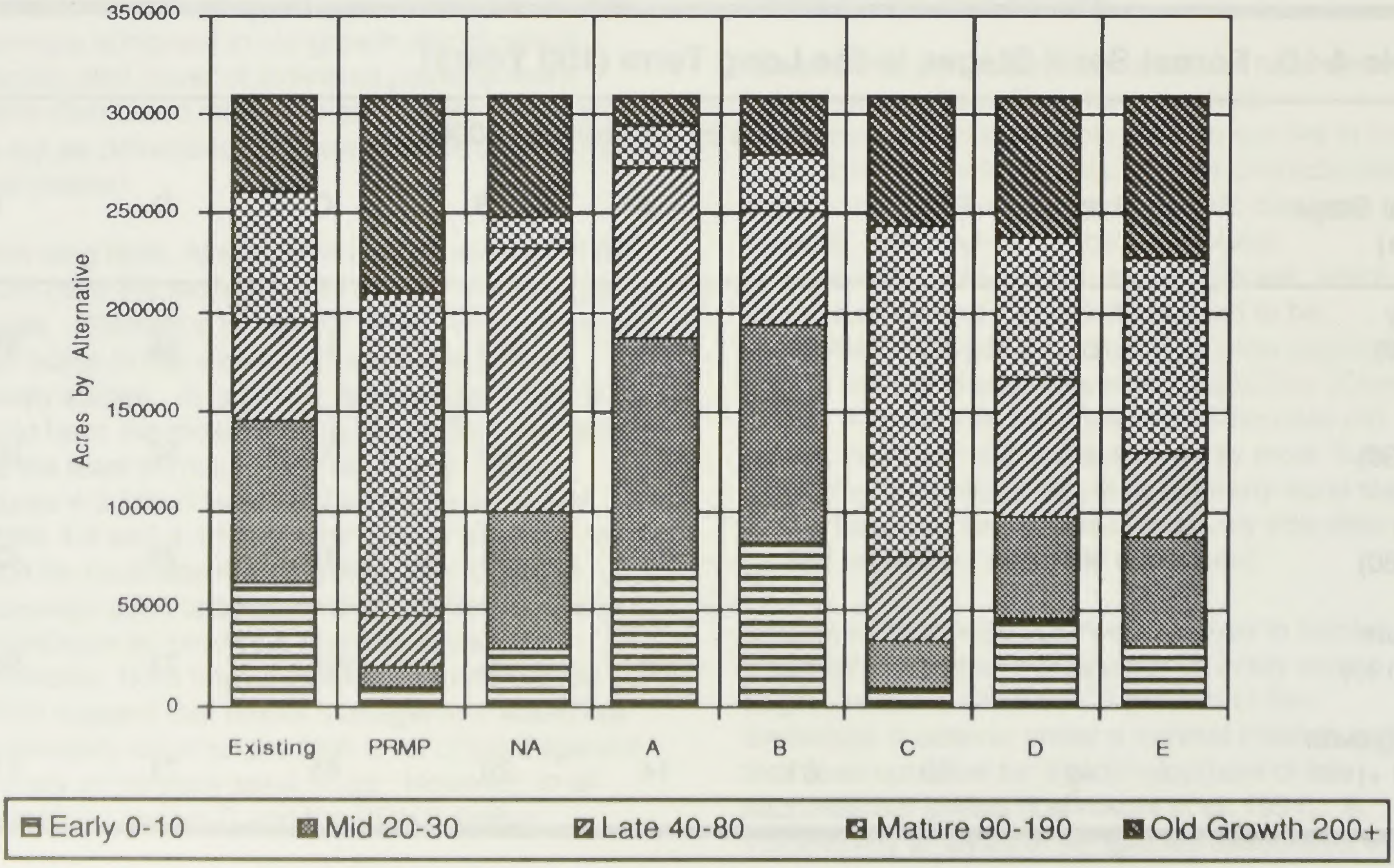


Figure 4-3. Forest Seral Stages Long Term (100 Years)



late-successional coniferous forests of the region placed 80 percent of the species into the moderately-high and high-risk categories (Lehmkuhl and Ruggiero 1991).

Ecosystem and Stand Diversity

Late-seral and old-growth forests are the most limited habitat available in the planning area. As discussed previously, more old-growth habitat would be provided under Alternatives C, D, E, and the PRMP than under Alternatives NA, A, and B in the long term. Almost the reverse would happen with late-seral habitat in the long term, where acreages would increase under Alternatives NA, A, B, and D, and decrease under Alternatives C, E, and the PRMP. Alternative C assumes that, in the long term, 40 percent of the stands managed to retain at least 35 percent of total basal area at regeneration harvest would possess old-growth characteristics (as defined by the Old-Growth Definition Task Group). Another 40 percent would be mature forest. It is also assumed that 33 percent of stands managed to retain 15-20 percent retention of total basal area at regeneration harvest would be mature forest 100 years from now.

Most forest lands intermingled with BLM-administered lands in the checkerboard ownership pattern of the planning area are privately owned, with a substantial portion owned by wood products companies. Most of these lands are expected to be managed intensively for timber production in the future as they have in the past. The relatively short harvest rotation on many private forest lands means that, at any given time, the early- and mid-seral stages would be predominant with most of the remaining lands in the late-seral stage. Little mature and old-growth forest would remain on these lands. Accordingly, mature and old-growth forests on BLM-administered lands and national forest lands would provide essentially all the mature and old-growth habitat remaining in the planning area.

An exception to this may be the Elliott State Forest adjacent to the western portions of the Coos Bay District's Umpqua and Tioga Resource Areas. A proposal under the Draft Elliott State Forest Plan to manage significant acres on long rotations would provide some mature forest habitat.

Recent U.S. Forest Service and Wilderness Society estimates show about 1.9 million acres of old-growth forest remaining on national forest lands in western Oregon. This acreage—added to the approximately 400,000 acres of old-growth stands on BLM-administered lands in the region—represents 15 percent of all western Oregon forest lands. In contrast, it has been estimated that prior to settlement, 60-70 percent of western Oregon and Washington forests were old-growth (Franklin and Spies 1984). However, a subregional study shows that only 40 percent of much of the Oregon Coast Range was old growth in 1850 (Teensma et al. 1991).

The Forest Service has not yet calculated the acreage of old-growth stands on National Forests in western Oregon that would be retained under the SEIS ROD. Analyses comparison in the SEIS and in the Forest Service's 1992 spotted owl EIS suggests that their old-growth acreage would be approximately 1.5 million acres. BLM's six proposed RMPs for western Oregon would provide for the retention of approximately 346,000 acres of old growth, which would result in a cumulative total approaching 1.8 million acres. As existing younger stands age and develop old-growth characteristics, BLM-administered lands in western Oregon are expected to support 336,000 acres of old-growth stands after 10 years and 718,000 acres after 100 years. These projections make allowance for anticipated losses due to catastrophic events.

Projection of the recent wildfire record noted in the Analysis of the Management Situation indicated that less than one percent of BLM-administered forest lands would burn in stand-replacing fires in the next 100 years. Therefore, no adjustments were made for fire in Figure 4-3. Land tenure adjustments under Alternatives C, D, E, and the PRMP would increase the acres of mature and old-growth stands primarily in the long term.

The proposed harvest of 1,100 acres of old-growth stands during the first decade under the PRMP would cause a minor adverse reduction in biological diversity. It would also cause an irreversible and irretrievable commitment of resources, at least until those stands are recreated.

Another important aspect of ecosystem diversity is the variety of special habitats (e.g., talus slopes, cliffs and meadows) that exist on BLM-administered lands in the planning area. These habitats would be partially protected through TPCC withdrawals under all alternatives. Alternatives C, D, and E provide additional protection by buffering special habitats from management activities. The PRMP provides protection based on SEIS survey and manage provisions. Under Alternatives NA, A, and B, special habitats could be vulnerable to incidental disturbance from activities adjacent to these habitats. Special habitats could be impacted by mineral exploration and development activity on mining claims under all alternatives. However, the probability of such impacts are considered low due to the lack of mineral exploration and mining claim activity on BLM-administered lands in recent years.

The 18,000 acres of hardwood stands on BLM-administered lands provide another important element of ecosystem diversity. On lands allocated for timber production, hardwoods would be reduced by conversion of some lands (those considered to be conifer sites) to conifer production under all alternatives. Such conversion would merely return conifers to lands previously converted to hardwoods as a result of poor reforestation following logging or other factors. However, this reduction in hardwood habitat would reduce species and ecosystem diversity in affected areas. In the short and long term, fewer hardwood acres would be converted under Alternatives NA, C, D, E, and the PRMP compared to A and B.

The amount and condition of riparian zones and special areas including research natural areas are other indicators of effects on ecosystem diversity. They are discussed in greater detail in the subsequent sections, Effects on Riparian Zones and Effects on Special Areas. In general, riparian zones and special areas would receive increasingly greater protection under Alternatives B, C, D, E and the PRMP compared to Alternatives NA and A.

In the short term, the number of snags/wildlife trees would be comparable to the existing condition under all alternatives. In the long term, Alternatives C, D, E, and the PRMP would enhance the availability of snags and wildlife trees compared to Alternatives NA, A, and B. Uneven-aged management under Alternative C would emphasize retention of structural diversity in both the short and long term. Effects on snags and wildlife trees are discussed in greater detail in the subsequent Effects on Wildlife section.

Alternatives C, D, E, and the PRMP would also enhance the availability of dead and down woody material compared to Alternatives NA, A, and B in the long term. However, in the short term, similar levels of dead and down material are expected under all alternatives. Since large dead and down woody material decays very slowly and all alternatives would leave some of this material in harvested areas, only small differences among the alternatives are expected in the amount of this material remaining in the short term. In the long term, however, those lands planned for clearcut harvest at relatively short intervals would not produce the large trees capable of contributing large, down, woody material. Accordingly, within 100 years, such material would largely disappear from intensively-managed forests.

Cumulative effects of the alternatives and actions on other lands in the planning area are expected to reduce the aggregate amount of dead and down woody material. Most private timber companies use intensive management practices and manage on short rotations, which would limit the amount of this material in both the short and long term.

Landscape Diversity

A significant aspect of landscape diversity is fragmentation of mature and old-growth forest stands. Of concern are the size of remnant blocks and their isolation or spatial arrangement. Over most of the planning area and for all alternatives, the number of large blocks available in the short term may not provide adequate habitat for wide-ranging, forest interior animals such as marten and fishers. Although data is largely lacking, forest interior species would probably be supported by blocks in the long term under Alternatives C, D, E, and the PRMP.

In all alternatives, many of the blocks identified would be dissected by roads that will remain open due to: (1) continued use of existing roads for access to other lands including lands in private ownership, (2) additional road construction under terms of existing reciprocal right-of-way agreements, and (3) additional road construction by the BLM to provide access to other lands for resource management, if alternative access routes are considered more ecologically damaging. Impacts of existing and possible future roads have not been considered in identification of interior habitat, but would probably diminish the quality of the habitat in these blocks.

In the short term and under all alternatives, blocks predominately stocked with mature and old-growth forest would be scattered throughout the planning area, reflecting the current distribution of the older forest habitat in the district. Connectivity between blocks would be provided by the extensive pattern of lands excluded from timber harvest under Alternative E and, less so, under Alternative D. Restoration and Retention blocks provided under Alternative C would be connected by BLM-administered lands managed by partial cutting. These would retain substantial mature and old-growth forest characteristics throughout time. Connectivity/Diversity blocks provided under the PRMP would be connected primarily by Riparian Reserves and administrative withdrawals. Limited connectivity would be provided under Alternatives NA and B in the form of small blocks which would serve as stepping stones between larger reserved blocks. The least connectivity would be under Alternative A.

Large areas of young forest between old-growth stands can lead to isolation of some species of animals and plants that rely on these old-growth habitats. The resulting inbreeding can reduce the ability of these species to survive.

Effects on Forest/Ecological Health

Healthy forests are dynamically stable with characteristics and processes fluctuating within a range of natural variability. When management processes result in pushing of ecosystems outside of the range of natural variability, there is an increased risk that ecological functions will not be maintained at either the stand or landscape level. This risk does not mean that all elements or processes must be maintained within their natural range, but that care must be taken to control undesirable and unintended side-effects of management actions.

Managing for more complex ecosystems would provide for retention of a greater number of parts and provide a reserve or resiliency against unforeseen contingencies. The simplification of the ecosystem associated with an intensively-managed forest may result in less resistance to insects and pathogens and less ability to adapt to changing environmental conditions such as a potential long-term climate change or increased levels of air pollution (Franklin et al. 1989).

Intensive timber production practices may contribute in the short term to more vigorous trees due to optimal spacing, low vegetation competition, and utilization of the fastest growing species for the site. Long-term effects of intensive timber production and short rotations could reduce stand species and structural diversity, increase spread of root diseases, and reduce soil nutrient reserves, all of which could negatively affect forest health.

Alternatives NA, A and B have the highest allocations of land for intensive timber production, which in the long term, could negatively impact forest health. By allowing only limited timber production, Alternative E—in the absence of health restoring measures—could lead to reduced stand vigor, increased tree mortality, and increased risk of stand-replacing fires in the long term. Alternatives C and D allow for only restricted management practices which could include restorative measures that positively impact forest health. The PRMP provides a balance of intensive and restricted timber production practices, as well as health restorative measures, that should allow for improved forest health.

Long-term estimation of how the various alternatives affect ecological health is very speculative. In general, as components of biodiversity are positively impacted, forest ecosystem/health should be positively affected. Alternatives C, D, E, and the PRMP all contain provisions that allow for forest/ecosystem health operations to occur with similar positive long-term results.

Conclusion

In the short term, genetic diversity, snags/wildlife trees, and dead and down woody material are expected to remain comparable to existing conditions. In addition, several elements of biodiversity would be benefited in the short term under Alternatives C, D, E, and the PRMP (e.g., special habitats, riparian zones, research natural areas, blocks of older forest, and special status animals). In the long term, most elements of biodiversity would be benefited under Alternatives C, D, E, and the PRMP. One exception would be the early seral stage which would decline under these alternatives.

Effects on Vegetation

Impacts of Forest Management Activities

The amount of forest management activities would generally affect the availability of vegetation under all alternatives by impacting the mixture of successional stages in the planning area.

The major impacts of the alternatives on vegetation, other than those that may affect the viability of individual special status and special attention species, would be caused by forest management activities. Other management activities that would affect vegetation include: riparian enhancement, forage seeding, noxious weed control, and mineral exploration or development. Effects on vegetation relative to special status and special attention species; riparian zones; biological diversity; and the structure, composition and fragmentation of the forest are discussed in separate sections of this chapter.

Under all alternatives the BLM-administered forest lands would continue to be primarily a patchwork of even-aged stands, but with the acreage in stands over 100 years of age substantially declining in all alternatives except C and the PRMP. Under Alternatives D and E, some of the lands would continue to be characterized by this mosaic; in the long term, however, many areas would remain intact, ageing to or toward old-growth condition, altered only by natural disturbances such as wildfires, windstorms, and insect or disease infestations. Under Alternative C and the PRMP, the forest condition would be the most complex. Many areas or stands would age to old-growth condition in the long-term, but some would contain many small patches of younger forest; other areas would resemble a patchwork of even-aged stands of various ages, but with a scattered residue of older standing live and dead trees.

Figures 4-2 and 4-3 (in the Biological Diversity section) compare the acres of coniferous forest that would occur in each of five seral stages, by alternative, at the end of 10 and 100 years.

The use of vegetation management practices, including herbicide application, would suppress target vegetation, but not eradicate it. Other forest management practices such as thinning and fertilization would enhance growth rates, particularly of Douglas-fir, and promote succession. The management direction for managing competing vegetation is contained in the Record of Decision for the *Western Oregon Program-Management of Competing Vegetation*, 1992.

Some smaller vegetative communities that occur within special habitats (serpentine barrens, bogs, meadows, rock cliffs, and talus slopes) would be partially protected from direct impacts by TPCC withdrawals under all alternatives. Alternatives C, D, and E would provide additional protection from external influences by buffering areas considered to be significant by IDT review. The widest buffers (100 to 300 feet) would be maintained in Alternative E. In Alternatives NA, A and B, such buffers would not normally be maintained, making vegetation communities in special areas vulnerable to incidental disturbance from activities on adjacent lands. Under the PRMP, buffers would be maintained around special habitats found to be significant through IDT review. Special habitats could be impacted by mineral exploration and development activities under all alternatives. The probability of such impacts are considered low, however, due to lack of mining claim activity on BLM-administered lands in recent years.

Impacts to Pacific Yew

A species of special interest—the Pacific yew—is not defined as a special status species. The interest is based on a compound (taxol) that can be extracted from yew trees and shows promise as a treatment of a variety of cancers. Pacific yew are not considered abundant enough to permit unconstrained harvesting of their bark. The management direction for Pacific yew is contained in the Record of Decision (ROD) for the environmental impact statement (EIS) on Pacific yew prepared by the U.S. Forest Service, with the BLM as a cooperating agency. The final EIS and ROD, published in September 1993, addresses the effects of BLM management on the yew.

Impacts to Port-Orford-Cedar

Another species of interest—Port-Orford-cedar—is not defined as a special status species. Interest is based on the spread of Port-Orford-cedar root rot (*Phytophthora lateralis*), as well as the high value received for export quality logs. Management of drainages containing significant quantities of Port-Orford-cedar would be in accord with the soon to be completed Port-Orford-cedar management plan. Measures included in the plan have been effective in reducing the spread of the root rot.

Alternatives proposing shorter rotations and higher PSQs (A, B, and NA) would reduce the availability of high quality Port-Orford-cedar logs for export over time. Alternatives with longer rotations (E), or lower PSQs (C, D, E, and the PRMP) would continue to make the larger high quality logs available over time.

Impacts to Non-Native Species, Noxious Weeds, and Aquatic Vegetation

European beachgrass (*Ammophila arenaria*) found to be encroaching in snowy plover nesting habitat and native plant communities in special areas such as New River and the North Spit would be controlled under all alternatives. Various control measures such as hand pulling, burning, and scarification would be utilized as needed.

Although increased road access—particularly in Alternatives A and B—would provide additional opportunities for the spread of noxious weeds, implementation of the weed control measures described in the *Northwest Area Noxious Weed Control Program*, Record of Decision would stabilize or reduce noxious weed populations on BLM-administered lands.

None of the alternatives would substantially affect aquatic vegetation.

Impacts from Land Tenure Adjustments

Vegetation could be altered on land exchanged from public ownership as a result of land tenure adjustments. If transferred to private ownership, some former BLM-administered lands are expected to be managed more intensively or be converted to their highest productive potential—such as tree farming, improved pasture, and rural homesite. Use would be restricted by state laws and local regulations, and land use ordinances.

Conclusion

In the short term, vegetative communities are expected to remain comparable to existing conditions. In the long term, vegetative communities associated with early-successional stages are expected to decline under Alternatives C, D, E, and the PRMP, and increase under Alternatives NA, A, and B. Conversely, vegetative communities associated with late-successional stages would be expected to increase under Alternatives C, D, E, and the PRMP, and decline under Alternatives NA, A, and B.

Impacts on Special Forest Products

The alternatives would affect the availability of Special Forest Products (SFPs) primarily in two ways:

- By the degree to which they permit SFPs to occur (see Chapter 2, Vegetation).
- By the objectives and silvicultural systems chosen to meet timber management and forest health objectives.

Alternatives NA, A, and B would provide the largest number of acres open or unrestricted for SFP harvest. Alternatives C, D, E, and the PRMP would have the fewest number of acres open or unrestricted.

In general, SFPs which are shade intolerant would be favored under Alternatives NA, A, and B. Those that are shade tolerant would be favored under Alternatives C, D, E, and the PRMP. Likewise SFPs adapted to younger forests would be favored under Alternatives NA, A, and B. Those more adapted to older forests or forests containing older components would be favored under Alternatives C, D, E, and the PRMP.

Access to harvest sites is also a factor in SFPs availability. Alternatives NA, A, B, D, and the PRMP propose the greatest amount of new road construction. Alternatives A, B, and NA propose the fewest miles of road closures. Alternatives C, PRMP, D, and E propose closure of more roads.

Properly harvested, many SFPs can sustain repeated harvests with little or no short-term effects on resource availability. Products capable of repeated harvests are generally those with root systems that are not disturbed during harvest operations. For some species light disturbance may stimulate growth of new vegetation. As the demand for SFPs increases, the probability of adverse impacts (e.g., over harvesting) would also increase.

Table 4-11 displays the projected effects of the alternatives on the availability of SFPs.

Conclusion

In general—based upon increased acres in early-successional stages and decreased acres in late-successional stages—the availability of Special Forest Products would be increased under Alternatives NA, A, and B and decreased under C, D, E and the PRMP.

Table 4 -11. Effects of the Alternatives on the Availability of Special Forest Products Being Harvested by Alternative [1]

		Alternatives [2]					
	PRMP	**NA**	**A**	**B**	**C**	**D**	**E**
Products derived from conifers and hardwoods [3]	-	0	+	+	-	-	-
Cones	-	0	0	0	0	0	0
Christmas trees	-	0	+	+	0	0	-
Wildings	?	0	?	?	?	?	?
Boughs	-	0	+	+	0	-	-
Greenery	0	0	+	+	0	0	0
Moss	-	0	-	-	+	+	+
Ferns	-	0	+	+	+	+	+
Mushrooms	-	0	-	-	+	+	+
Burls	-	0	-	-	-	+	+

[1] Considers management actions, vegetative successions, and management restrictions specific to alternative.

[2] Impacts:
+ = Availability would increase.
- = Availability would decrease.
0 = No change in availability.
? = Unknown or species dependent until watershed analysis is completed.

[3] Sawtimber, pulpwood, marginal logs, cedar bolts and shakes, posts and poles, fuelwood

Effects on Riparian Zones

None of the actions under any of the alternatives are expected to significantly impact wetlands. However, there would be varying effects on existing riparian zones, depending upon the specific management direction for each alternative, the width of riparian management areas, and the amount of vegetative disturbance occurring within those areas. Expected conditions of riparian zones in the short term (10 years) for Alternatives A through E and the PRMP are shown in Table 4-12 and Table 4-13.

Under all alternatives except A, riparian conditions would improve in the short term due to increasing maturity and diversity of riparian vegetation. The existing condition (36 percent minimum, 16 percent fair, and 48 percent in good/optimal condition) of the riparian habitat is a result of past management activities. At the end of the short term, 27 percent of the riparian acres would be in minimal condition (classes 1 and 2), 23 percent in fair condition (class 3), and 50 percent in good/optimal condition (class 4).

Riparian conditions are also expected to improve in the long term for all alternatives except A. On lands available for timber harvest, Alternatives A, B, C, and D would allow harvesting along first order streams that are not perennial. In Alternatives A, B, and C—which allow harvest along second order streams that are not perennial—any associated riparian areas adjacent to first and second order streams could be adversely impacted and converted to the minimal stand condition. By incorporating the Aquatic Conservation Strategy objectives of the SEIS ROD, the PRMP provides the most protection for riparian habitat. Under the PRMP, all streams—whether intermittent or perennial—would be included in a Riparian Reserve with a width equal to 1 to 2 potential site tree height. Also, wider Riparian Reserves and more protective measures are required for perennial and fish-bearing streams under the PRMP than for the other alternatives.

Under the PRMP, Riparian Reserve widths may be reduced after watershed analysis of existing conditions in watersheds, but only if (1) the best science-based information available shows that aquatic and riparian habitat values can be maintained with reduced Riparian Reserve widths, and (2) the Regional Ecosystem Office reviews and approves the reduction. By including more protection of intermittent streams, the PRMP will provide for greater overall watershed protection of upslope, riparian, and downstream areas than the other alternatives.

Approximately 8,600 acres of existing riparian habitat is in less-than-good stand condition for all alternatives except the PRMP (see Table 4-12). Because of wider riparian zones, the PRMP is projected to have 35,206 acres of existing riparian habitat in categories below the good class (see Table 4-13). The condition of these streams could improve with:

- Specific types of watershed restoration projects to attain a desired future condition identified through watershed analysis as part of the Aquatic Conservation Strategy.
- Implementation of the strategies and actions identified in BLM's national "Riparian-Wetland Initiative for the 1990s" and state and district plans developed to complement that initiative.

With the planned management actions, these streams could be in proper functioning condition and be advanced ecologically. Riparian enhancement work performed in these areas could expedite the development of 200-year-old stand characteristics. However, some riparian acres that are wet sites and are naturally dominated by hardwoods would not be enhanced to a conifer overstory stand condition. The conversion effort should result in a mixed hardwood understory and a conifer-dominated overstory. The enhancement effort would require the harvest and removal of some hardwoods to release suppressed conifers and/or prepare the site for conifer planting. The standard protection measures for streams, and the spacing and distribution of treatments, should avoid any impacts to water quality. The PRMP will require watershed analysis prior to site disturbance project activities within the riparian reserves.

Long-term conditions for all alternatives except A are also displayed in Table 4-12 and 4-13. At the end of the long term, expected riparian conditions under all alternatives except A would be good/optimal for all streams. Conditions under Alternative A are expected to be in fair condition due to narrow riparian management area widths (i.e, minimal vegetation diversity).

The effect of the various alternatives on harvesting of any riparian vegetation of first and second order streams by riparian stand condition is not quantified because the acreage for those areas is not readily obtainable through the GIS data base. The guidance does, however, provide for protection of perennial waters in first and second order streams in all alternatives except A. The PRMP would additionally protect riparian vegetation along all channels that are definable and show annual evidence of scour and fill (ephemeral-intermittent channels). Because the protection varies by alternative, there may be a lack of large wood input and adequate protection of any fish-bearing streams affected. In Alternative A, where those riparian zones could be subject to adverse impact, first and second order streams would not be protected. Generally, protection of first and second order streams would increase with the alternatives proceeding from Alternative B through E and the PRMP, with the PRMP receiving the most protection.

Road and log-yarding corridors through riparian zones would remove varying amounts of vegetation under Alternatives A through E, but would require watershed analysis under the PRMP as required by the SEIS ROD. These corridors would likely remove more riparian vegetation under Alternatives NA, A, and B than the other four alternatives because their higher harvest levels would necessitate crossing more streams. These impacts would be fairly localized; while possibly severe at the site-specific level, adverse consequences would be partially mitigated by management practices utilizing BMPs.

Research has been conducted through COPE on the succession of red alder-dominated riparian areas, particularly where alder may have eliminated conifer establishment. One hypothesis is that as alder breaks down over time, the increased light into the stands promotes highly competitive brush species such as salmonberry. These competitive species rapidly increase leaving little opportunity for establishment of tree species. This brush growth would greatly reduce the riparian area's ability to input large coniferous wood back into the stream channel in the near future, and could also have a negative effect on shade and temperature regulation for the streams affected. Management techniques will be needed to address the problems in the coming decade.

Mineral activities of leasable, locatable, or salable resources could have the potential to impact riparian zones. For leasable minerals, the effects on riparian areas would vary by alternative. Alternatives A, B, and the NA—which have limited riparian protection and intensive harvest levels—could reduce affected RMAs to the minimal stand condition. Alternatives C, D, E, and the PRMP—which could have stipulations on the lease for riparian zones—could provide more protection. Because they are guided by the Aquatic Conservation Strategy, anticipated leasable mineral activities are not expected to impact aquatic habitat.

Locatable mineral activity during the past decade has centered on recreational gold mining on the South Fork Coquille River, Sixes River, and the Elk River. Potential mining development, as described in Appendix W, may damage riparian areas and aquatic habitat.

On lands open to mineral activity, under all alternatives, enforcement of measures in 43 CFR 3809 would provide protection to riparian areas. Removal of trees from a riparian management area to facilitate mining, however, could result in minimal stand conditions which could adversely impact a stream.

Salable mineral entry activities under all the alternatives should have no effect on riparian management areas.

Land tenure is another management activity that could affect riparian zones. Alternatives that do not allow for the exchange of federal timberlands for the benefit of non-timber resources (Alternatives A, B and the NA) could have a negative impact from foregoing opportunities to acquire additional riparian acres for beneficial uses.

Table 4-12. Estimated Condition of Riparian Zones Under Alternatives B Through E[1]

	Acres of Each Condition Class[2] by Stream Order									
	Existing Condition				Short Term[3]				Long Term[4]	
Stream Order	1 min.	2 min.	3 fair	4 good+	1 min.	2 min.	3 fair	4 good+	4 good+	Total Acres
3	1,290	1,383	984	3,194	439	1,612	1,488	3,312	6,851	6,851
4	594	1,015	661	2,262	202	950	1,039	2,341	4,532	4,532
5	376	559	461	1,429	128	555	658	1,484	2,825	2,825
6	70	239	267	837	24	177	343	869	1,413	1,413
7	149	298	201	272	50	265	310	295	920	920
8	0	0	0	0	0	0	0	0	0	0
9	0.3	0	11	50	0.1	0.2	10	51	61.3	61.3
Total	2,479.3	3,494	2,585	8,044	843.1	3,559.2	3,848	8,352	16,602.3	16,602.3

[1] Conditions not assessed for Alternative A.

[2] Riparian condition class equates to size of trees (dbh) in riparian zones:
Class 1 (minimal condition) = 0 to 5 inch trees
Class 2 (minimal condition) = 5 to 11 inch trees
Class 3 (fair condition) = 11 to 21 inch trees
Class 4 (good/optimal condition) = trees greater than 21 inches

[3] End of short term (10 years).
Estimated changes from existing conditions:
66% of Class 1 goes to Class 2
45% of Class 2 goes to Class 3
12% of Class 3 goes to Class 4

[4] End of long term (200 years).

Source: District timber inventory.

Table 4-13. Estimated Condition of Riparian Zones Under the PRMP

	Acres of Each Condition Class [1] by Stream Order									
	Existing Condition				Short Term [2]				Long Term [3]	
Stream Order	1 min.	2 min.	3 fair	4 good+	1 min.	2 min.	3 fair	4 good+	4 good+	Total Acres
3	6,974	7,311	5,174	17,097	2,371	8,624	7,843	17,718	36,556	36,556
4	2,250	3,937	2,587	8,773	765	3,650	4,048	9,084	17,547	17,547
5	1,012	1,462	1,237	3,599	344	1,472	1,747	3,748	7,311	7,311
6	225	562	675	2,025	76	458	847	2,106	3,487	3,487
7	337	787	562	675	115	656	849	742	2,362	2,362
8	0	0	0	0	0	0	0	0	0	0
9	0	0	112	112	0	0	0	225	225	225
Total	10,798	14,059	10,347	32,281	3,671	14,860	15,334	33,623	67,488	67,488

[1] Riparian condition class equates to size of trees (dbh) in riparian zones:

Class 1 (minimal condition)	=	0 to 5 inch trees
Class 2 (minimal condition)	=	5 to 11 inch trees
Class 3 (fair condition)	=	11 to 21 inch trees
Class 4 (good/optimal condition)	=	trees greater than 21 inches

[2] End of short term (10 years).
Estimated changes from existing conditions:
66% of Class 1 goes to Class 2
45% of Class 2 goes to Class 3
12% of Class 3 goes to Class 4

[3] End of long term (200 years).

Assumptions:

- All 3rd through 9th order streams are considered to be perennial fish-bearing streams and would have a 2 site potential tree Riparian Reserve width.
- Site potential tree heights used Douglas-fir (Howell et al. 1994).
- Average district riparian slope used to calculate acreages was 51 percent.
- Riparian condition class was considered not to vary by width of the Riparian Reserve.
- Information was not available to display acres of 1st and 2nd order riparian condition.
- Acres of riparian zones within Riparian Reserves under the PRMP may include riparian and some transitional areas.

Source: District timber inventory.

Effects on Wildlife

Introduction

Habitat indices were calculated for some priority habitats and species for the existing condition and alternatives by use of habitat models (USDI BLM 1991c). Several of these models—such as the elk model (Wisdom et al. 1986) and cavity dweller models (Marcot 1991, Neitro et al. 1985)—have received wide professional acceptance. Others were derived by BLM biologists and planners specifically for this and other western Oregon BLM EISs. The analysis of wildlife effects is based in part on the analysis in the SEIS where applicable. Indices derived under the various models predict such factors as the amount, quality, and distribution of habitat. The assumptions and analytical approaches for each wildlife habitat model are found in Appendix Y. In cases where habitat models were unavailable or were not derived, analysis of impacts was based on literature references or personal communications with experts.

Impacts on Habitat

Forest management activities affect wildlife primarily by modifying habitat. Thomas (1979) and Brown (1985) indicated that certain wildlife species are associated with forests of a particular age class and structure. The close affinity of wildlife for specific habitat conditions underscores the importance of analyzing impacts of forest management activities on habitat composition. All species of wildlife known or suspected to occur within the planning area by primary habitat association are listed in Appendix T.

The assessment of impacts on habitat is based on the expected availability of conifer, special, and riparian habitats under each alternative in relation to the existing condition. The impacts of road construction and access on all habitat are also analyzed. Also related to effects on wildlife, and discussed in previous and subsequent sections, are effects on vegetation and biological diversity (including discussions of dead and downed wood and hardwoods). Effects on special status and SEIS special attention species are addressed in the Special Status and SEIS Special Attention Species section of this chapter.

Conifer

Conifer forests comprise the dominant habitat of BLM-administered land in the planning area. Habitat composition under the various alternatives is displayed in the discussions of Effects on Vegetation and Biological Diversity.

The current seral stage distribution in the district is dominated by stands less than 80 years old (Table 3-22). Maintenance of the current distribution would limit the abundance and distribution of wildlife species preferring late-seral stage and old-growth habitat. Continuation of a forest dominated by early-seral stages would occur under all alternatives through the next decade (see Figure 4-2). This condition would be alleviated in the long term under Alternatives C, D, E and the PRMP, but Alternatives NA, A, and B would maintain the age class distribution close to the existing situation in the long term (see Figure 4-3). The abundance of species preferring early-seral stages would likely be reduced under Alternatives D, E, and the PRMP in the long term due to less timber harvest. However, additional early-successional habitat will continue to be created through logging and other management activity on nonfederal land to reduce this effect. Alternative C with its emphasis on density management harvesting would result in mixtures of openings and residual tree cover in specified areas of the district. The effects on wildlife from density management thinnings are likely to be both beneficial and adverse, depending on the species.

In the long term, Alternative C would likely provide moderate levels of old-growth species and species preferring early-seral stages compared to the existing situation; Alternatives NA, A, and B would provide higher levels of early-successional species and lower levels of old-growth associated species; and Alternatives D, E, and the PRMP would provide higher levels of old-growth associated species and lower levels of early-successional associated species. Moderate abundance levels of species anticipated under Alternative C compared to the existing situation would result from management for older-forest habitat elements interspersed among some younger forest stages.

Cumulative effects from activities on BLM-administered land and actions on other lands (i.e., private and other public lands) would be detrimental to older-forest habitat and species requiring mature and old-growth habitats under Alternatives NA, A, and B. Reductions in mature and old-growth habitat would be an unavoidable adverse impact.

Widespread clearcutting on private lands in conjunction with harvest rates on public lands has created an age class distribution dominated by younger age classes throughout western Oregon (ODF 1990). This cumulative effect and the probability that such timber harvest practices would continue on most private lands magnify the importance of mature and old-growth habitat on public land as a relatively scarce regional habitat. Cumulative effects from adoption of Alternatives C, D, E, or the PRMP would be less detrimental to older-forest habitat because of increased protection on BLM-administered lands. Alternatives D, E, and the PRMP would lead to more mature and old-growth habitat than currently exists on BLM-administered lands.

Special Habitats

The primary resource feature in special habitats (meadows, rock cliffs, and talus slopes) would be protected under each alternative. Intact forest buffers do not exist around some of these habitats. Alternatives NA, A, and B do not specifically afford buffer protection for special habitats, whereas protected buffer areas under Alternatives C, D, and E would range from 100-300 feet. The PRMP provides protection for special habitats based on interdisciplinary review and determination of relevant values for protection or management on a case-by-case basis (see Chapter 2 Special Status and SEIS Special Attention Species). This level of protection is equivalent to Alternative C. Of particular importance in these determinations will be the habitat of species for which the SEIS ROD provides protection buffers. In addition, the PRMP, which tiers to the management direction adopted in the SEIS ROD, includes survey and manage and protection buffer provisions that would benefit special habitats. Many rare or geographically restricted species are associated with these habitats. The SEIS discussed the importance of special habitats (e.g., rock outcrops, bogs, and wetlands) to rare and local plants; and the importance of springs or seeps to rare and/or endemic mollusks. Studies in the Salem District determined that removal of tree cover along edges of small meadows reduced bird density and caused changes in bird species composition (Monthey 1983). Special habitats on adjacent Forest Service lands would be protected the same as BLM lands, but little protection is anticipated on private lands.

Riparian

Because of increasing maturity of riparian vegetation under all alternatives except Alternative A, riparian habitat conditions for wildlife would generally improve in the short term. The amount of riparian habitat protected, however, would vary by alternative with progressive increases in protected riparian habitat occurring under Alternatives NA through the PRMP. Wildlife species that prefer or are dependent on riparian habitat would be expected to increase in the long term under Alternatives C, D, E, and the PRMP compared to Alternatives NA, A, and B. Riparian habitat adjacent to wetlands would not be protected under Alternatives NA, A, and B, but these areas would be protected under Alternatives C, D, E, and the PRMP by buffers ranging from 100 to more than 500 feet. See Effects on Riparian Zones section for additional details. Cumulative effects would follow a similar pattern for all alternatives.

General Habitat

Roads have major impacts on wildlife habitat by direct elimination of vegetation within rights-of-way (BLM roads and roads constructed under reciprocal right-of-way agreements) and by disturbance and mortality of wildlife caused by increased human access. Big game species are especially vulnerable to these road impacts (Brown 1985). Road construction resulting from timber management under Alternatives A and B would have the greatest adverse effects on wildlife habitat; Alternatives NA and D would have intermediate effects; and Alternatives C, E, and the PRMP would have the least effects. Although more roads would be constructed under the PRMP than Alternatives NA and D, the road management proposed for the PRMP would effectively reduce the number of miles or road open to general use to levels similar to Alternatives C and E. Wildlife populations that benefit from less human disturbance and the overall quality of habitat would likely increase under Alternatives C, E, and the PRMP. Cumulative effects caused from activities on BLM-administered lands and other lands would be detrimental to wildlife because of high road densities estimated to occur on the latter, especially non-federal lands.

Impacts on Priority Species

This section covers Roosevelt elk, dominant woodpeckers, and other priority species (osprey, great blue heron, black-tailed deer, black bear, mountain lion, amphibians, neotropical migrant birds, and accipiter hawks). Discussions of spotted owls, bald eagles, and marbled murrelets are included under Special Status and SEIS Special Attention Species.

Roosevelt Elk

The assessment of impacts on Roosevelt elk habitat on BLM-administered land was based on a modification of the elk habitat effectiveness model developed by Wisdom et al. (1986) (see Appendix Y). The Wisdom model was modified, with concurrence by the Oregon Department of Fish and Wildlife, by dropping the spacing index (HEs) and presenting values for each index rather than producing a composite score for all indices. Because the model has not been validated, its predictive capability is uncertain. Only analytical watersheds exceeding 25 percent BLM ownership were included in the analysis. This percentage was selected as the level at which BLM management would have significant impact on elk habitat.

Assessments of short-term impacts on elk habitat under the various alternatives are shown in Table 4-14. Impacts on elk vary by watershed based on existing conditions of habitat relative to proposed actions. Generally, impacts would have more adverse effects under Alternatives NA, A, and B. This would be caused by higher levels of harvesting in watersheds already short on optimal thermal cover and by more road construction in watersheds with already high road densities. Alternative C would have mixed impacts on elk. Although Alternative C has fewer clearcut acres proposed, there are some adverse impacts—primarily related to road construction and additional habitat modification caused by extensive thinnings. Thinnings tend to reduce thermal cover while not increasing forage levels significantly compared to clearcuts. However, forage levels on adjacent private lands should be adequate. Adverse impacts on elk would generally be less under Alternatives D, E, and the PRMP. This is primarily due to lower levels of harvest and fewer road impacts including possible closures of roads due to watershed and other concerns. Less available forage on BLM-administered lands under these alternatives would be partially balanced by the availability of forage in adjacent non-federal lands. However, this would not be true in several watersheds which are primarily Late-Successional Reserves and where no appreciable harvest of private lands are anticipated.

Although long-term impacts on elk habitat were not quantitatively assessed (because a long-term timber harvest scenario was unavailable), improvements in habitat and populations under Alternatives D, E, and the PRMP are anticipated. This is due to increased levels of optimal thermal cover and potentially fewer timber harvest impacts. Optimal thermal cover would be available in Alternative C in restoration and retention areas, in Alternative D in habitat conservation areas, in Alternative E in 150-year and older stands and other protected wildlife habitat, and in the PRMP in Late-Successional Reserves and other reserves.

Cumulative effects of activities on BLM-administered lands and other lands in the planning area are expected to cause a general decline—not necessarily in individual watersheds, however—in elk habitat quality and in numbers of elk under Alternatives NA, A, and B. This expected decline is due to anticipated low levels of thermal cover and more road construction in watersheds already high in road densities. An improvement in habitat quality and elk numbers is anticipated under Alternatives D, E, and the PRMP in the long term despite less than optimal conditions on private lands. Alternative C would affect elk by road construction and habitat modification caused by extensive thinnings on BLM-administered lands in combination with high anticipated clearcutting on adjacent private lands. Elk habitat on private lands is mostly younger seral stages which provide abundant forage and increasing amounts of thermal cover. Road densities are often high on private lands and clearcuts are usually larger than on BLM-administered lands, which causes less forage/cover edge habitat. Forage would still be available for elk using cover on BLM-administered lands under Alternatives D, E, and the PRMP because of intensive timber harvest on adjacent private lands.

An unavoidable adverse impact of the PRMP on elk habitat is the reduction in the amount of optimal thermal cover, which is considered an important component of elk habitat (Brown 1985). This reduction is considered an irreversible or irretrievable commitment of resources due to the length of time required in regenerating these stands. Although reduced habitat availability from the elimination of optimal thermal cover may have adverse impacts on the population size of elk herds, additional optimal habitat is expected in Late-Successional Reserves over time as regrowth of this habitat occurs.

Dominant Woodpeckers

Dominant woodpeckers within the planning area include the hairy woodpecker, downy woodpecker, pileated woodpecker, northern flicker, and red-breasted sapsucker. SEIS special attention species are discussed in the Special Status and SEIS Special Attention Species section of this chapter. All of the dominant woodpecker species depend on excavating nest cavities in dead trees or live trees with dead tops or branches. The downy and pileated

Table 4-14 . Assessments of Short-Term Impacts on Elk Habitat in the Planning Area

Analytical Watershed	Existing Rating Condition			Predicted Change After Ten Years By Alternative [1]						
	HEr[2]	HEc[3]	HEf[3]	PRMP	NA	A	B	C	D	E
Lower Smith River	.35	.35	.36	+	-	-	-	+	+	+
Middle Umpqua	.25	.34	.37	0	-	-	+	0	0	+
Loon Lake/Camp Creek	.22	.42	.45	-	-	-	+	+	-	-
South Fork Coos	.35	.52	.38	-	-	-	-	+	+	+
North Fork Coquille	.26	.39	.38	+	-	-	+	+	-	+
East Fork Coquille	.23	.38	.45	+	-	-	-	+	+	+
Middle Fork Coquille	.11	.36	.47	+	-	-	-	+	+	+

[1] Index for road density (HEr), cover (HEc) and forage (HEf) ratios based on projected increases or decreases from existing condition. (See Appendix Y.)

- = Declining condition relative to existing condition.
0 = No change.
+ = Improving condition.

[2] Calculated for BLM and non-BLM-administered lands within watersheds with greater than 25 percent BLM ownership (or elk management areas).

[3] Calculated only for BLM-administered lands.

woodpeckers require nest snags in forested stands while the others may nest in snags in more open habitats. Impacts of the alternatives on these species depend on the management direction intended for specific land allocations (e.g., number, size, and condition of snags and trees planned for retention) and the changes in condition of these snags over time.

Under all alternatives, most lands not allocated to intensive or restricted timber management would be managed to create or retain adequate numbers of snags to provide for 100 percent of optimum populations over the long term.

Two levels of analysis were conducted to examine the impacts of the alternatives. First, for lands allocated to intensive or restricted timber management, the number of snags potentially available within stands for various timber harvest regimes was modeled over time (Marcot 1991). Secondly, for the entire landscape within the Coos Bay District, the abundance of snags was estimated using age class distributions to estimate habitat potential for the dominant woodpeckers (Neitro et al. 1985).

Snag Modeling on Lands Allocated for Planned Regeneration Timber Harvest

On lands allocated to intensive and restricted timber harvest in Alternatives NA, A, and B, only snags and unmerchantable green trees would be retained in regeneration harvest units. During the past decade, the NA Alternative resulted in the retention of less than one snag per acre on harvest units. These snags and culls would primarily benefit dominant woodpeckers that nest in open areas. However, many of these snags retained under the NA are soft snags, which likely will decay and fall down in the short term. Modeling indicated this management direction is not adequate to retain appropriate levels of snags needed by dominant woodpeckers. This direction would result in few or no nest sites available on these lands after 40 years.

On lands allocated to restricted timber management in Alternative C there would be two general silvicultural practices: high and low green tree retention. Modeling (Marcot 1991) indicates that both regimes are able to maintain snag numbers over time to maintain at least 60 percent population levels for most species. However, for nesting, pileated woodpeckers prefer larger patches of dense older forest which may be very limited for this species in the long term under Alternative C.

On lands allocated to intensive and restricted timber harvest in Alternatives D and E, approximately five hard snags and green trees per acre would be retained after regeneration harvest. Modeling indicates this level should maintain nesting sites for at least 60 percent of optimum population levels for most species except pileated woodpeckers. To provide for this same percentage of snags in the long term, however, some of the residual green trees may have to be killed by girdling and other methods.

Under the PRMP, green tree retention requirements in the General Forest Management Area would be adequate to provide at least 65 percent of optimum population levels in the long term. To provide snags, however, some green trees may have to be killed or topped.

Landscape Evaluation

Snag densities were estimated for 10 and 100-year intervals for BLM-administered lands at the landscape level using procedures outlined in Appendix Y. This analysis used anticipated snag density levels within various age classes provided under each alternative. Snag densities were then related to population levels of woodpeckers by the use of a model developed by Thomas (1979) and further developed by Neitro et al. (1985). In this analysis, three snags per acre corresponds to 100 percent population levels, 1.8 for 60 percent levels, and 1.2 for 40 percent levels. Because the model has not been validated, its predictive capability is uncertain.

In the short term, Alternatives C, D, E, and the PRMP would likely maintain current populations (60 percent of optimum levels) of dominant woodpeckers due to the scarcity of suitable habitat (see Table 4-15). In the long term, population levels of dominant woodpeckers are expected to decrease or remain at current low levels under Alternatives NA, A, and B. However, population levels should equal or exceed 60 percent levels under Alternatives C, D, E, and the PRMP.

Cumulative effects of the alternatives and actions on other lands in the planning area are expected to maintain low snag abundance and cavity-user populations in the short term. Few large trees are left on private lands clearcut in the last 30 years except in state-mandated buffer strips, and this situation will likely continue in the foreseeable future. Wildlife trees retained on BLM-administered land and other public lands frequently comprise the majority of snag and large green tree habitat available for cavity-dwellers within an area of mixed public and private ownership.

Table 4-15 . Estimated Population Levels of Dominant Woodpeckers at End of First and Tenth Decades by Alternative

(Percent of maximum population)[1]

Decade	PRMP	NA	A	B	C	D	E
1st	65	57	52	53	64	65	63
10th	75	45	30	33	90	75	66

[1] Current level of dominant woodpeckers is 60 percent.

Osprey

Osprey abundance is most dependent on the availability of snags for nesting habitat and prey base near reservoirs, lakes, and major rivers and streams. Although ospreys frequently nest in riparian areas and may also nest in upland areas in proximity to large bodies of water. For example, approximately 10 percent of the ospreys along the Umpqua River nest in upland areas (Witt, J. pers. comm.). Upland areas would likely be affected by intensive timber harvesting to a greater degree than riparian areas which receive varying protection under all alternatives. However, the effect of intensive timber harvesting in upland areas can be reduced by leaving large broken-topped wildlife trees after timber harvest. In the short term, the current number of ospreys is expected to be maintained under Alternatives NA and C, decreased under Alternatives A and B, and increased under Alternatives D, E, and the PRMP (see Table 4-16). In the long term, Alternatives C, D, E, and the PRMP should increase osprey numbers in contrast to other alternatives. Ospreys respond positively to the installation of artificial nesting structures which may be attached at the apex of topped trees (Witt 1990) and the maintenance of large, old wildlife trees.

The cumulative effect of Alternatives NA, A, and B and actions on adjacent ownerships would likely result in fewer ospreys or numbers comparable to existing levels. Greater numbers of osprey might be anticipated under other alternatives.

Great Blue Heron

Great blue heron abundance is related to the availability of suitable nesting habitat (mature and old-growth forests near bays, rivers, or lakes) and prey species. In the long term, numbers of great blue herons are expected to decrease under Alternatives NA, A, and B. This is because intensive timber management practices would cause a lower availability of nesting habitat. Conversely, numbers of herons would be expected to increase under Alternatives C, D, E, and the PRMP in the long term due to increased availability of suitable nesting habitat and protective buffers around existing heron rookeries.

Riparian habitat on private lands currently receives less protection than on federal lands. In addition, very little mature/old-growth habitat remains on private lands. Existing great blue heron rookeries are protected to some degree on state and private lands, but there is little allowance for maintenance of potential nesting habitat. The cumulative effect of Alternatives NA, A, and B would reduce the potential number of herons. More herons would be expected under Alternatives C, D, E, and the PRMP.

Black-tailed Deer

There is a large population of black-tailed deer in the Coos Bay District. Because habitat conditions would not change significantly during the next decade, the abundance of black-tailed deer would be roughly comparable under all alternatives in the short term. In the long term, under Alternatives NA, A, B, and C, the populations of black-tailed deer would probably be comparable to existing levels. Alternatives D, E, and the PRMP would provide more optimal thermal

Table 4-16 . Estimated Effects of Alternatives on Other Wildlife Species

Species	Time Frame	PRMP	NA	A	B	C	D	E
Osprey	ST	+	0	-	-	0	+	+
	LT	+	-	-	-	+	+	+
Great blue heron	ST	+	0	0	0	0	0	0
	LT	+	-	-	-	+	+	+
Black-tailed deer	ST	0	0	0	0	0	0	0
	LT	-	0	0	0	0	-	-
Black bear	ST	0	0	0	0	0	0	0
	LT	-	0	0	0	-	-	-
Mountain lion	ST	0	0	0	0	0	0	0
	LT	-	0	0	0	0	-	-
Amphibians	ST	+	-	-	+	+	+	+
	LT	+	-	-	+	+	+	+
Neotropical migrant birds [1]	ST	-	-	-	-	+	+	+
	LT	+	+	+	+	-	-	-
Accipiters	ST	0	0	0	0	0	0	0
	LT	+	-	-	-	-	+	+

Abbreviations used in this table:
ST= Short Term
LT= Long Term
0 = No change
- = Declining
+ = Improving

[1] Refer to the text for an explanation.

cover in the long term compared to other alternatives. The availability of this thermal cover, intermixed with forage in natural canopy gaps and in adjacent private lands, could increase deer numbers in the long term. Within the Late-Successional Reserves where there is no land which will provide forage, however, black-tailed deer populations are expected to decline.

Cumulative effects of anticipated high harvest levels and short harvest rotations on some adjacent lands—along with harvest levels proposed for BLM-administered lands under Alternatives NA, A, and B and actions on other lands—could result in localized boom-and-bust phenomena. This phenomena causes fluctuating deer populations as deer respond to the cyclical levels of forest harvest caused by even-aged timberland management in western Oregon (Brown 1985). Characteristic of this phenomenon is an initial high abundance of forage in response to overstory canopy removal, followed by low production of forage due to increasing shade from the overstory canopy. Deer populations tend to increase during periods of high browse availability, then decrease when forage is scarce. These short rotations are expected to continue in the future as timber companies respond to market demand. Cumulatively, deer populations are expected to be lower but more stable under Alternatives D, E, and the PRMP than under Alternatives NA, A, B, and C.

Black Bear

Black bears are omnivorous and forage heavily on fruit, green forage, and tree cambium—foods that tend to be more prevalent in younger seral stages. However, Noble et al. (1990) recently pointed out that since black bears use large rootwads as den sites, they should also benefit from areas of mature forests. The authors further stated that policies having protection of snags and dead and downed woody material should improve bear habitat. Based upon these conclusions, moderate-to-high populations of bear would be anticipated in areas with a good mixture of younger seral stages for food and mature stands for denning habitat. In areas within Late-Successional Reserves where there would be no younger stands, lower populations would be anticipated.

In the short and long term, Alternatives NA, A, and B would maintain moderate-to-high populations of black bear. Alternatives C, D, E, and the PRMP would likely maintain existing population levels in the short term. In the long term, these alternatives may be have reduced black bear populations due to reduced availability of food materials on BLM-administered lands. This reduced food availability may be partially compensated by adequate forage on adjacent nonfederal lands. Denning habitat is expected to increase under Alternatives C, D, E, and the PRMP. Cumulative effects would follow a similar pattern for all alternatives.

Mountain Lion

Mountain lion numbers are apparently dependent upon the abundance of deer since deer are their major food item. Therefore, alternatives which benefit black-tailed deer habitat should at least maintain or increase mountain lion numbers in western Oregon (ODFW 1987a). In the short term, mountain lion populations are expected to remain comparable to existing levels. In the long term, mountain lion numbers would be expected to be correlated with deer numbers. Cumulative effects would follow a similar pattern for all alternatives.

Amphibians

Refer to the Special Status and SEIS Special Attention Species section of Chapter 4 for effects analysis of individual species. The abundance and diversity of amphibians is related to the availability of stable, undisturbed riparian habitat along streams, ponds, talus slopes, and dead and downed woody debris that helps retain moisture. Water quality is also an important factor (Nussbaum et al. 1983). The limiting factor for many amphibian species is the availability of water and moist substrates on land for breeding (Nussbaum et al. 1983). The quality and quantity of riparian zones under the various alternatives is a major factor in the quality of habitat for amphibians. In the short term, more amphibians would be expected under Alternatives B, C, D, E, and the PRMP than under NA and A. This is due to increased protection and improved condition of riparian habitats (see impact section for riparian zones). Also, Alternatives C, D, E, and the PRMP would provide increasing protection of upslope habitat including small, headwater streams apparently important to species such as the Olympic salamander and tailed frog (Nussbaum et al. 1983). The PRMP would provide the best distribution of this habitat. In the long term, riparian habitat conditions would improve with progressively increasing protection under Alternatives B, C, D, E, and the PRMP as the streamside vegetation is allowed to grow toward a mature, stable, undisturbed condition.

Cumulative effects of the alternatives and actions on other lands in the planning area would likely improve the condition of amphibians in the long term. This would occur as riparian habitat grows into more stable, mature forests on federal lands and as OFPA rules improve habitat on private land relative to the past few decades. However, regional impacts unrelated to forest land management (e.g., increased UV light exposure) are also concerns for these species.

Neotropical Migrant Birds

Concern has increased in recent years about apparent widespread population declines of neotropical migratory bird species which migrate between Central/South America/Mexico and North America (French 1991). Based on analysis of neotropical bird population trends in Washington state (Andelman and Stock 1993), birds with suspected declining trends in the planning area include: killdeer, band-tailed pigeon, rufous hummingbird, barn swallow, golden-crowned kinglet, solitary vireo, orange-crowned warbler, yellow warbler, Wilson's warbler, chipping sparrow, song sparrow, and pine siskin. Causes of their declines are unknown, but possible reasons include loss of habitat on the breeding or wintering ranges and pesticide use.

Some neotropical species—such as red-breasted sapsuckers, willow flycatchers, common yellowthroats, and black-headed grosbeaks—indicate stable or increasing trends, while many other species have unknown trends (Andelman and Stock 1993).

An estimated 85 species of neotropical migrants occur within the planning area. About 27 species are associated with early-seral coniferous forest stages, 26 with mid-to-late seral stages, 27 with mature conifer forest, 27 with hardwood forests, and 55 with riparian areas (Andelman and Stock 1993).

Based on habitat affinities of neotropical migrants, Alternatives A, B, and the NA would provide more early-seral stage habitat and would favor 27 species of neotropical migrants (Andelman and Stock 1993). However, the removal of large acreages of conifer overstory under these three alternatives would adverse affect 26 species associated with mid-to-late seral stages and 27 associated with mature and old-growth habitats. Of those associated with mature stages, it appears that the band-tailed pigeon, Vaux's swift, Hammond's flycatcher, Swainson's thrush, black-throated gray warbler, Townsend's warbler, and hermit warbler would be the species which would be most impacted. Hermit warblers and Vaux's swifts are of special significance since their breeding range is confined to conifer forests in the Pacific Northwest. In the short and long term, the PRMP—followed by Alternatives E, D, and C—would favor 27 species associated with mature conifer forest. Fifty-five species of neotropical migrants would likely benefit from progressively greater riparian protection under Alternatives C, D, E, and the PRMP. These species would have less habitat under Alternatives NA, A, and B. In the short and long term, species associated with hardwoods would likely have greater amounts of hardwood habitat under Alternatives C, D, E, and the PRMP compared to NA, A, and B.

Of particular concern with this group of species is the cumulative effects of the alternatives in conjunction with the recent large-scale habitat changes created by federal and private timber harvest and land development in the Pacific Northwest along with habitat loss and pesticide use on the wintering grounds. It is quite likely that several of these species have experienced substantial population declines in the past few decades and are more vulnerable to future habitat changes. Long-term monitoring and inventories are lacking in the western United States. However, no major declines have been conclusively documented.

Accipiter Hawks

Effects on northern goshawks are discussed in the Special Status and SEIS Special Attention Species section of this chapter. Cooper's and sharp-shinned hawks prefer dense, unthinned stands for nesting (Reynolds 1983), primarily in the mid- and late-seral stages (20-90 years old). Thinnings in these stages can have adverse impacts on accipiters. The amount of thinnings expected under each alternative in the short term is shown in Table 4-1. About 60 percent of the stands managed for timber production (20 percent in first decade) are expected to receive light thinnings under all alternatives except C and the PRMP. Under Alternative C (except for General Forest Management Areas), 90 percent of stands are expected to be subject to density management. This management represents a series of heavier cuts than traditional lighter silvicultural thinnings planned elsewhere. Heavier density management thinnings could adversely impact these accipiters. Although thinnings would be an important activity under the PRMP to promote development of old-growth-like conditions, eventually these thinned stands would attain old-growth-like conditions and thinning activities would decline in Late-Successional Reserves. Fewer overall acres would be treated under Alternatives D and E than in other alternatives. Thus, accipiters would likely have more suitable habitat in the long term under Alternatives D and E, and in the PRMP (as thinning activities subside) compared to the other alternatives. Under the PRMP, thinning will be permitted: 1) in stands less than 80 years-old in Late-Successional Reserves; and 2) in the General Forest Management Area where applicable.

The number of Cooper's and sharp-shinned hawks would vary in accordance with the availability of unthinned habitat on BLM and adjacent lands within the planning area. The amount of thinnings on adjacent (mostly private) lands are expected to be at least comparable to current levels on BLM-administered lands under all alternatives. The cumulative effects of thinning on BLM-administered and private lands would adversely affect the amount of accipiter habitat and accipiter populations. Cumulative effects on northern goshawks would be detrimental under Alternatives NA, A, and B; effects would be less detrimental under Alternatives C, D, E, and the PRMP due to greater retention of existing older forest and greater allowance for future stands to develop to older forest conditions on BLM-administered lands.

Effects on Fish

Management of vegetation in a drainage basin primarily determines the quality of the fish habitat. Vegetation controls the movement of water through the basin, maintains water quality, stabilizes upslope and channel areas, and provides structural material for the stream channel. The headwater 1st and 2nd order streams, which account for approximately 70 percent of the total stream miles in the district, are the most geologically active part of the stream system and are important in determining downstream water quality. Timber management activities that change the forest successional age have both a short and long-term impact on the aquatic system.

Initial harvesting of timber in a basin may have little or no impact on fish production potential in the basin. However, as a greater percentage of the basin is harvested within a relatively short period of time, fish habitat may decline, sometimes quite rapidly, with impacts cumulative and extending downstream due to changes in hydrology, reduced water quality, and loss of large woody material. Most potential habitat losses may be prevented by retention of riparian communities and the use of Best Management Practices (BMPs) for constructing roads and landings and protecting potentially unstable areas.

Large woody debris provided by the riparian area appears to be the most important single component controlling fish habitat conditions and salmonid populations (Bisson et al. 1987, Brown 1985). Partial or total removal of large woody debris sources usually creates a reduction in the number and quality of pools, off-channel habitat, and gravels used by fish and other aquatic species (Andrus et al. 1988, Bilby and Ward 1989, Crispin et al. in press, Heifetz et al. 1986, House and Crispin 1990, House et al. 1989, House and Boehne 1987, and House and Suther 1991). The input of large woody debris is a major link between terrestrial and aquatic ecosystems (Lienkaemper and Swanson 1987). A basic assumption in evaluating the quality of riparian vegetation is that mature riparian zones dominated by large conifers maintain or enhance stream channel conditions. Downed large trees provide instream habitat for fish by creating pools and backwater areas and by retaining gravel deposits. They also improve water quality by trapping sediments, stabilizing stream channels, and slowing high flows.

The number of downed trees and pieces of large woody debris varies with stand age of riparian zones (Sedell et al. 1988). Studies done on streams flowing through young growth forests and recently harvested areas showed they contained from 5-20 percent large woody debris pieces as streams in mature forests. The potential amount of large woody debris in a channel is determined by the width of a riparian protection area. A 94-foot width is capable of providing most of the necessary large woody debris (Murphy and Koski 1989), and a 164-foot width is capable of providing an optimum amount of large woody debris (Van Sickle and Gregory 1990).

Overall fish habitat conditions are currently improving in stream segments with adjacent BLM-administered lands. This trend is expected to continue in the short term for all alternatives, but the rate of improvement will be slow because most riparian areas are in early successional stages and are dominated by deciduous trees. Full recovery of fish habitat potential depends on a substantial conversion of riparian vegetation to conifers and the maturation of these conifers to mature size large enough to remain stable in the stream channel over time.

For the streams included in a particular alternative, recovery depends on the width of the Riparian Management Areas or Riparian Reserves. The length of time needed for recovery varies by the type of existing vegetation. The normal succession is a gradual change from shrubs, hardwoods, and young conifers to large conifers. Active management of riparian areas can accelerate the process of riparian recovery to stands consisting predominantly of large conifers. These large trees would provide most of the large woody debris required for achieving optimum stream conditions.

Stream improvement and riparian conversion projects proposed under all alternatives would speed the recovery of the productive potential in the improved streams. Monitoring of existing habitat improvements show they can provide optimum habitat equivalent to unaltered streams. The projects would be undertaken only to address existing problems in the short term and would not be a substitute for restoring and maintaining stream channels and riparian areas through natural processes. Natural habitat has a much greater longevity than projects that last an average of 10 years.

The PRMP would provide the greatest protection of aquatic habitat because it incorporates the Aquatic Conservation Strategy objectives of the SEIS ROD and Best Management Practices. Specific protection through the Aquatic Conservation Strategy would be from following components of Riparian Reserves, Key Watersheds, Watershed Restoration, and

Watershed Analysis. Compared to most other alternatives, the PRMP provides wider Riparian Reserves and more protective measures for perennial and intermittent streams. Watershed analysis, which uses the best information available, may show that riparian values can be maintained with reduced riparian reserve widths.

By including greater protection of intermittent streams, the PRMP will provide for greater overall watershed protection of upslope, riparian, and downstream areas than other alternatives. This will help stabilize hydrologic function, water quality and, in time, large woody debris recruitment within the drainage. This is important because the cumulative effects of management actions on fish habitat over entire watersheds may be more critical than effects on any single component of fish habitat. Because of the funding uncertainty for watershed restoration and the activities on nonpublic lands, it may be impossible to estimate how much the production potential will increase through watershed restoration.

In the long term, aquatic habitat recovery will continue under all alternatives except A. Based on comparisons with the SEIS, recovery will occur more rapidly under the PRMP than under the other alternatives due to greater upslope reserves and wider riparian reserves, particularly in headwater streams. Even if changes in land management practices and comprehensive restoration are initiated, however, it is possible no alternative will completely recover all aquatic systems within the next 100 years.

The productive capability for fish is directly correlated with the quality of habitat. As habitat improves, so does the productive potential of habitat for fish. The actual fish production from streams on public lands is strongly influenced by actions outside the planning area, and is currently well below the potential.

Habitat recovery depends on regrowth of conifers in and adjacent to the riparian area to attain mature age classes so large conifer trees are available to fall into the stream and create fish habitat. In the 10-year time period for the short term, conifers cannot grow to a size that could make a meaningful contribution for the creation of instream fish habitat. Natural recovery of early stands of conifers will take much longer than 10 years to develop to the structural size to be considered large woody debris. Therefore, during the short-term time period of 10 years, there will be very little difference among all alternatives, except for Alternative A which has smaller buffer protection widths. Besides having the least riparian protection, Alternative A also would not attain recovery in the long term (200-year time period). The other alternatives, which have adequate riparian protection for large wood input, would recover to approximately the same extent in the 200-year time period.

Productivity potential in 3rd order and larger streams will increase for Alternatives NA, B, C, D, E, and the PRMP. The PRMP analysis of effects incorporates, by reference, the conclusions of the SEIS. Specifically incorporated are conclusions about Alternative 9 of the SEIS.

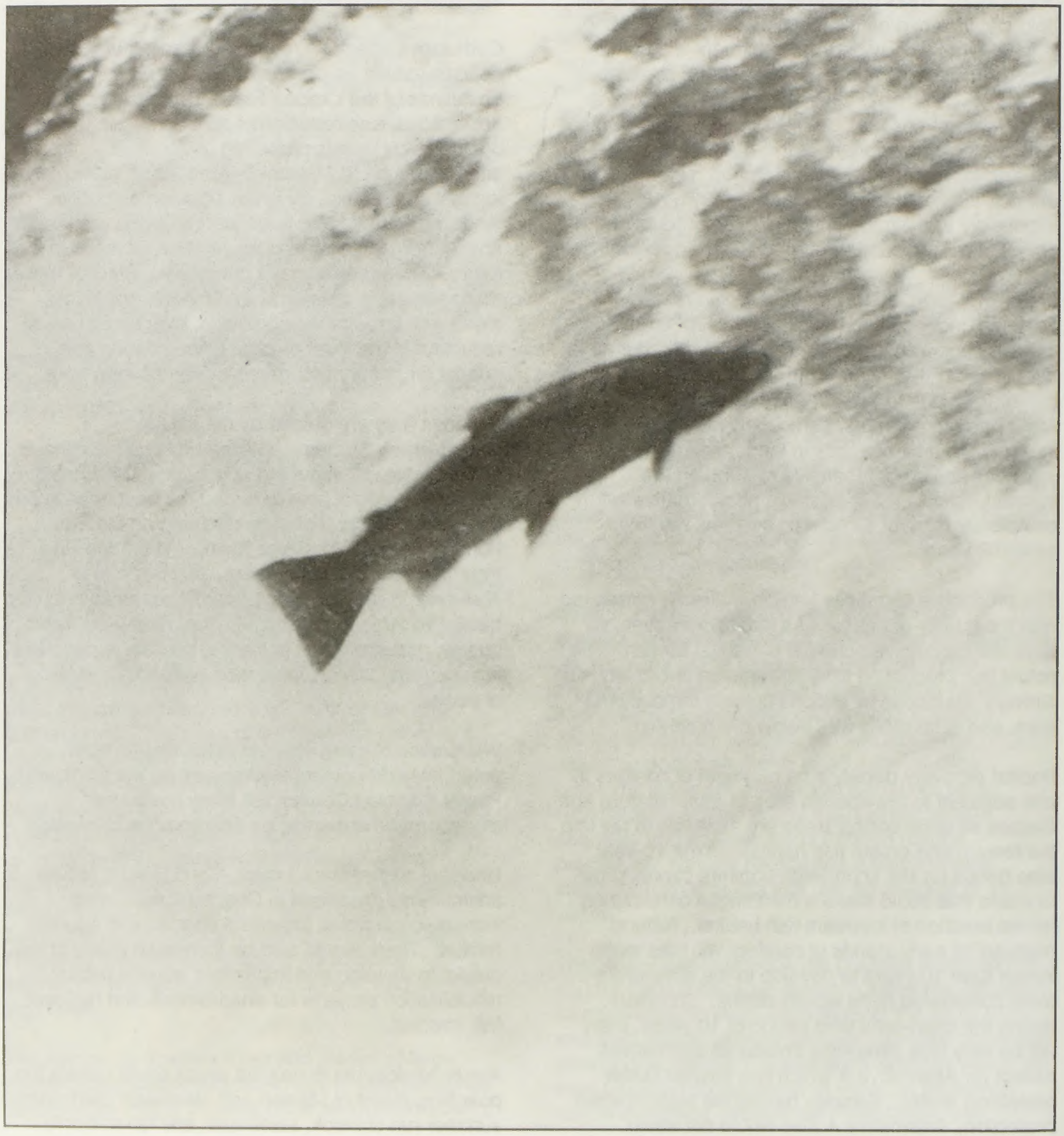
Cumulative effects in regard to management of riparian habitat on private lands depend in part on guidelines of the Oregon Forest Practices Act. This act requires less retention of riparian vegetation and downed logs than is proposed under most alternatives on BLM-administered lands, particularly in smaller streams. As is the situation on public lands, large trees and large woody debris are largely absent from streams and may not be replaced in the future. Therefore, a major cumulative effect of timber management in individual watersheds, especially those with large private holdings, may be an overall reduction in the level of large woody debris and habitat for priority fish species over the long term.

Because they are guided by the Aquatic Conservation Strategy, anticipated leasable mineral activities are not expected to impact aquatic habitat. Locatable mineral activity during the past decade has centered on recreational gold mining on the South Fork Coquille River, Sixes River, and the Elk River. Potential mining development, as described in Appendix W, may damage riparian areas and aquatic habitat through increased siltation, degraded water quality, disturbance of spawning gravels, a decrease in substrate stability, increased scouring, and filling of pools.

Withdrawal of most streams in the district from potential hydropower development by the Northwest Power Planning Council will allow continued migration and spawning by anadromous salmonids.

Under all alternatives except A and B, land tenure adjustments described in Chapter 2 will permit increased control of important riparian and aquatic habitat. There would also be increased ability of the district to develop and implement aquatic habitat rehabilitation projects for anadromous and resident fish species.

Any road closures in riparian areas could reduce the poaching threat of salmon and steelhead (particularly summer run chinook, steelhead, and fall chinook) which has been a major problem in some accessible areas. Actual closing of roads would be a result of watershed analysis, implementation of the district limited access plans, and the NEPA process. Increased recreational development in some areas would increase access to spawning areas and the probability of disturbance and poaching of spawning fish. Recreation development planned under the Aquatic Conservation Strategy is not expected to have negative impacts on fish, but rather may enhance fishing opportunities for resident and anadromous salmonids and other game species.



Effects on Special Status and SEIS Special Attention Species

Introduction

Special status plant and animal species within the Coos Bay District are listed and described in Chapter 3. SEIS special attention species are listed in Appendix G and some are described in Chapter 3.

Common to all alternatives is the requirement to protect federally listed and proposed species as legally required under the Endangered Species Act. Management of other special status species differs under each alternative. This is based on such factors as the administrative category of the species (e.g., federal candidate, Bureau sensitive, Bureau assessment, Bureau tracking, and state listed); the occurrence of these species on commercial or non-commercial forest land, and on O&C or public domain lands; and the lack of certainty about what is needed to maintain the viability of many species. Many special status species occur in special habitats such as wetlands, talus, dry meadows, and in riparian zones. The degree of protection afforded to some of these habitats will vary under each alternative.

Special Status Plants Including Bryophytes, Fungi, and Lichens

Effects of special status plants and their habitats could result from a variety of activities which take place in the planning area in conjunction with management of other resources. Known populations of special status plant species within the district generally occur in special habitats, are scattered, have small populations, and cover small areas. Activities within the district that pose the greatest threats to special status plants are associated with forest management, mineral development, and recreational activities and development. Within the forested landscape, timber management activities such as timber removal, site preparation, pre-commercial thinning, mortality salvage, vegetation control, and road construction could alter or destroy habitats and populations of special status plant species. However, some special status plant species, such as golden fleece (*Haplopappus arborescens*) and wayside aster (*Aster vialis*), could benefit from some forest management activities that open the canopy and increase light on the forest floor.

Mineral development could destroy populations and alter habitat by activities such as mineral exploration and extraction, road construction, and assessment work. Many sites high in minerals also support many special status plant species. For example, mining in and around Hunter Creek Bog would impact populations and destroy habitat for Waldo gentian (*Gentiana setigera*), California pitcher-plant (*Darlingtonia californica*), and California lady's-slipper (*Cypripedium californicum*).

Recreational development, which often occurs in areas that contain special status plant species, poses threats through the construction of roads, trails, parking areas, interpretative facilities, and campgrounds. Subsequent use of these developed areas may increase the likelihood of impacting special status plants. For example, a population of salt marsh bird's-beak (*Cordylanthus maritimus* ssp. *palustris*), a Federal Candidate species, is currently being impacted by OHV use. Adverse impacts associated with recreational use could be minimized where interpretation programs increase public awareness and sensitivity to native vegetation and ecosystems, resulting in less inadvertent damage to special status plant species and/or their habitats. Finally, the establishment of noxious weeds and the introduction of other non-native vegetation by human activities (either accidental or intentional) results in competition with native species for space and nutrients, often to the detriment of the latter species.

Because there is little information about the habitat requirements and life history of some special status plant species, the types of impacts that may negatively or positively affect populations and habitats are relatively unknown.

Currently, no federally listed plant species occurs in the Coos Bay District. Potential habitat is present for western bog lily (*Lilium occidentale*), a federally proposed endangered species on BLM-administered lands. If located on BLM-administered lands in the future, this species will be protected by provisions of the Endangered Species Act. Effects on other special status plant species (federal candidates; state listed; and Bureau sensitive, assessment, and tracking species) would vary by alternative. Table 4-17 lists special status plant species known to exist on BLM-administered lands and the anticipated effect of each alternative of the respective species.

The majority of special status plant species found on the Coos Bay District occur in special habitats such

Table 4-17. Potential Impacts to Special Status Plant Species During the Short Term (10 years) and Long Term (100 years) Under the Various Alternatives [1]

	Alternatives						
	PRMP	NA	A	B	C	D	E
Vascular Plants							
Federal Candidate							
Abronia umbellata ssp. *breviflora*	+/+	+/+	+/+	+/+	+/+	+/+	+/+
Bensoniella oregana	+/+	-/-	-/-	-/-	+/+	+/+	+/+
Cordylanthus maritimus ssp. *palustris*	+/+	-/-	-/-	+/+	+/+	+/+	+/+
Gentiana setigera	+/+	-/-	-/-	+/+	+/+	+/+	+/+
Lasthenia macrantha ssp. *prisca*	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Oenothera wolfii	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Phacelia argentea	+/+	+/+	+/+	+/+	+/+	+/+	+/+
Bureau Assessment							
Cypripedium fasciculatum	+/+	-/-	-/-	-/-	0/0	0/0	0/0
Romanzoffia thompsonii	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Sidalcea malvaeflora ssp. *patula*	+/+	-/-	-/-	-/-	0/0	0/0	0/0
Triteliea hendersonii ssp. *leachiae*	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Bureau Assessment and Tracking							
Abronia latifolia	+/+	+/+	+/+	+/+	+/+	+/+	+/+
Adiantum jordanii	0/0	-/-	-/-	-/-	0/+	0/+	0/+
Allium bolanderi	0/+	-/-	-/-	0/+	0/+	0/+	0/+
Arctostaphylos hispidula	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Brodiaea terrestris	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Castilleja ambigua var. *ambigua*	+/+	-/-	-/-	+/+	+/+	+/+	+/+
Cypripedium californicum	0/+	-/-	-/-	0/+	0/+	0/+	0/+

Table 4-17. Potential Impacts to Special Status Plant Species During the Short Term (10 years) and Long Term (100 years) Under the Various Alternatives [1] (continued)

	Alternatives						
	PRMP	NA	A	B	C	D	E
Darlingtonia californica	0/+	-/-	-/-	0/+	0/+	0/+	0/+
Dudleya farinosa	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Dulichium arundinaceum	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Eriophorum chamissonis	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Erythronium revolutum	0/+	-/-	-/-	-/-	0/+	0/+	0/+
Haplopappus arborescens	0/-	+/+	+/+	+/+	0/-	0/-	0/-
Hieracium bolanderi	0/+	-/-	-/-	0/+	0/+	0/+	0/+
Iliamna latibracteata	0/+	-/-	-/-	-/-	0/+	0/+	0/+
Lathyrus delnorticus	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Limonium californicum	+/+	-/-	-/-	+/+	+/+	+/+	+/+
Lycopodium inundatum	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Microcala quadrangularis	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Mimulus douglasii	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Monardella purpurea	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Phacelia verna	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Poa piperi	0/+	-/-	-/-	0/+	0/+	0/+	0/+
Polystichum californicum	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Sidalcea cusickii	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Trillium kurabayashii	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Lichens and Fungi							
Bryoria pseudocapillaris	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Neibla cephalota	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Teloschistes flavicans	0/0	0/0	0/0	0/0	0/0	0/0	0/0

Abbreviations used in above table:
0 = No effect
- = Negative effect
+ = Positive effect

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[1] Ratings are based on expected habitat/population impacts for the entire planning area. For any alternative, however, a positive impact could occur to a subpopulation or habitat area, even though a negative impact is expected for the entire population of the species. A reverse situation could also be true.

as sand dunes, coastal headlands, serpentine meadows, springs, wetlands, salt marshes, and/or in designated and proposed special areas. None of the known special status plant species currently occurring in the planning area require old-growth and/or mature forest habitats; therefore, no long-term effects to special status plant species are anticipated as a result of proposed forest management activities in these habitats. For these species, no effects are anticipated under any of the alternatives.

Adverse impacts that could occur on special status plant species and habitats under Alternatives NA, A, and B could elevate the status of affected species. The causes of adverse impacts under these three alternatives are: narrow riparian buffers, no buffers around special habitats, and fewer designated special areas. For example, narrow riparian buffers may increase the likelihood that populations of California globe mallow (*Iliamna latibracteata*) and pink fawn lily (*Erythronium revolutum*). Not providing buffers around meadows that support populations of bensoniella (*Bensoniella oregana*) would impact habitat and populations of this species. No special area designation of Hunter Creek Bog under Alternatives NA and A would impose fewer restrictions on mining and increase the likelihood of impacting populations of Howell's manzanita (*Arctostaphylos hispidula*), California lady's-slipper, California pitcher-plant, Waldo gentian, Bolander's hawkweed (*Hieracium bolanderi*), Del Norte pea (*Lathyrus delnorticus*), and Piper's bluegrass (*Poa piperi*). Not designating the North Spit of Coos Bay as an ACEC under Alternatives NA and A would result in continued adverse impacts to salt marsh bird's-beak from OHV use.

Special status plant species occurring in Hunter Creek Bog would be afforded the most protection under Alternatives B, C, and D, which provide for the area to be designated as an RNA/ACEC and proposed for mineral withdrawal. Conversely, if the mining claims prove to be valid, the mining claimants may file for patent and these lands could eventually change to private ownership. Alternatives E and the PRMP propose to designate Hunter Creek only as an ACEC, which will provide more protection of special status plants. The ACEC designation does not preclude mining, but would require the mining claimants to submit a Plan of Operation prior to mining activities.

Under Alternatives B through the PRMP, designation of the North Spit of Coos Bay as an ACEC will afford more protection of salt marsh bird's-beak, as a management plan will be developed for the ACEC to outline protective strategies for this species.

Under all alternatives, habitat would likely increase for pink sandverbena due to the management and control of European beachgrass at New River. Under Alternatives B through the PRMP, habitat improvement projects may also take place on the North Spit. While these projects would primarily be planned for snowy plover habitat enhancement, they would also benefit pink and yellow sandverbena.

Alternatives C, D, E, and the PRMP—generally in order of increasing protection—would enhance the quantity or quality of riparian and special habitats in contrast to Alternatives NA, A, and B (Table 4 - 17). The enhancement would result from increasing the buffer widths in riparian zones and surrounding special habitats, and increasing the number of special area designations.

Surveys for special status bryophytes, fungi, and lichen species are inadequate, but since the only occurrences of these species on BLM-administered lands occur along the coast there are no impacts anticipated at this time.

Very little protection is provided to special status plants on private lands. However, on adjacent National Forest lands, special status plants are managed according to provisions of the Endangered Species Act. Modeling to determine minimum viable populations and extinction probability has not been conducted for any special status plant species occurring in the planning area. Because of the absence of modeling, the number of separate populations needed to maintain viable species has yet to be determined. If effects reduced species below minimum viable population levels, the species would become vulnerable to extinction. If recovery did not occur, these long-term effects could cause an irreversible commitment of the resource leading to possible extinction of the species.

SEIS Special Attention Plant and Fungi Species

The analysis of impacts of the proposed resource management plan also incorporates by reference the conclusions in Appendix J2 of the SEIS with reference to lichens, bryophytes (mosses, liverworts, and hornworts), and fungi. In summary, the SEIS concluded that its Alternative 9—which was adopted in the PRMP—would have the following consequences:

Bryophytes

The PRMP, which tiers to the SEIS ROD, will provide the greatest protection for bryophytes through the development of "survey and manage" strategies for all land allocations and a greater protection of late-successional forests. The "survey and manage" strategies will protect all known and newly-located occurrences of some special attention bryophyte species and provide survey protocols that will benefit these species by better understanding the habitat requirements and their responses to forest management activities. Greater protection of late-successional forests through the establishment of Late-Successional Reserves will also benefit bryophytes by providing greater amounts of habitats for those species dependent on these habitats. Green-tree, snag, and coarse woody debris retention for all land allocations under the PRMP will provide appropriate microclimates for bryophytes to survive and suitable habitat for those species that are dependent on decaying wood. Large riparian buffers will also benefit bryophytes that are dependent on these habitats.

Buxbaumia piperi, which is currently the only SEIS special attention bryophyte species known on the district, occurs in a proposed Late-Successional Reserve. This species will be afforded protection under the PRMP through buffers and mitigation as outlined in the SEIS ROD (page C-27).

Impacts to bryophytes will be greatest under Alternatives NA, A, and B which afford less protection to riparian management areas and late-successional forests. Alternatives C, D, and E will have less impacts to bryophytes through more protection of late-successional forests, wider riparian management areas, and the retention of green trees, snags, and coarse woody debris. Unlike the PRMP, these six alternatives do not propose any "survey and manage" strategies for bryophytes.

Lichens

Special attention lichens will be afforded the most protection under the PRMP. Development of "survey and manage" strategies will protect known and newly-discovered occurrences for some species and better determine habitat requirements and impacts from forest management activities. Greater protection of late-successional forests under the PRMP will benefit lichen species dependent on those habitats, such as *Lobaria oregana*. Greater retention of large green trees for all land allocations will maintain habitat for lichen species that are canopy dependent and will also provide a source of propagules to disperse lichens into adjacent stands when conditions become available. Wider Riparian Reserves under the PRMP will better protect those lichen species dependent on these habitats.

The majority of special attention lichen occurrences on the district occur along the coast (*Bryoria pseudocapillaris*, *Niebla cephalota*, *Teloschistes flavicans*, and *Nephroma resupinatum*), in riparian areas (*Usnea longissima*), or in special areas or habitats (*Pseudocyphellaria anthrapsis*); these areas will have minimal impacts from forest management activities. Lichen species that are dependent on late-successional forests—such as *Lobaria oregana*- will benefit most under the PRMP which provides greater protection of these habitats.

Alternatives NA, A, and B will have the greatest impacts to special attention lichen species that are dependent on late-successional forests. Under these three alternatives, late-successional forest habitats will be afforded less protection, riparian management areas will be narrower, and green tree retention will be less. Alternatives C, D, and E will provide more protection to these species as more late-successional forests will be protected and forest management activities in all land allocations will be less intensive. Some risk to these species will remain due to activities on non-federal lands and effects unrelated to forest management activities such as acid rain, pollution, and global warming.

Fungi

Fungi will be afforded the most protection under the PRMP which provides for development of "survey and manage" strategies. Many of the special attention fungi are known from only a few sites, and the development of survey protocols will provide more information on habitat requirements and impacts from forest management activities. Some species (those with survey strategies 1 and 2) will be protected when occurrences are located. Greater protection of late-successional forests will provide more habitat for those species that are dependent on this habitat type. Retention of green trees (especially in clumps) will maintain the microclimate and associated habitats for late-successional fungi. The maintenance of coarse woody debris will provide a favorable microclimate and a suitable substrate for those fungi dependent on decaying wood. Distributions and habitat requirements for many of the special attention fungi species are unknown at this time, but the strategies proposed under the PRMP should provide the most protection to these species.

Impacts to fungi will be greatest under Alternatives NA, A, and B as less late-successional forests will be protected and fewer green trees will be retained. Alternatives C, D, and E will provide more protection to fungi as more late-successional forests will be protected, and forest management activities in all land allocations will be less intensive. Some risk to these species will remain due to activities on non-federal lands and effects unrelated to forest management activities such as acid rain, pollution, and global warming.

Impacts to commercially harvested fungi, such as golden chantrelle (*Cantherellus cibarius*), are unknown at this time and therefore the impacts are difficult to assess. Currently, there is little information on impacts of harvesting fungi, but one study on chantrelles has shown no impacts on productivity from harvesting over an eight-year period (Norvell 1994). The PRMP will evaluate whether the harvest of certain fungi will have adverse impacts on the resource and Late-successional Reserves. Where harvest of fungi is extensive, some restrictions may be imposed.

Vascular Plants

Although no vascular plant species are known to be entirely dependent or find optimal habitat in late-successional forests (Spies 1991), the special attention vascular plant species listed in the SEIS ROD will benefit most from the PRMP. At this time only *Cypripedium fasciculatum* (which is managed under the special status plant program) and *Allotropa virgata* are known to occur on the district. These two species and their habitats will be protected under survey strategies 1 and 2. Surveys prior to any land activities will benefit these species; if they are located, they will be protected. Under all other alternatives, these species would not be protected as only special status plant species would receive protection.

Early-Successional Species

Species that find optimum habitat in early-successional habitats will likely be maintained under the PRMP, due to the conclusion that the amount of these habitats is sufficient enough across the landscape. Also, in general, these species are good dispersers, have high reproductive rates, and are able to persist in small patches that result from small-scale disturbances (Hunter 1990, Smith 1966).

Special Status Animal Species

This section includes discussions on the following special status animal species: peregrine falcon, northern spotted owl, bald eagle, snowy plover, marbled murrelet, and Aleutian Canada goose.

Peregrine Falcon

Assessment of impacts on peregrine falcon habitat is based on the number of potential breeding and important foraging areas that would be maintained under each alternative. Any peregrine nesting sites would be protected and managed under all alternatives according to the guidelines of the Pacific Coast Peregrine Falcon Recovery Plan (USFW 1992) and in compliance with the ESA.

In the short term, peregrine falcon habitat would be expected to decrease under Alternatives A and B, remain similar to current levels under Alternative C, and increase in proportion to old-growth and riparian habitat protection that provide a majority of prey species habitat under Alternatives D, E, and the PRMP.

In the long term, the availability of suitable peregrine falcon habitat would depend on:

- Amount of old-growth protected and the amount of habitat allowed to grow into a diversity of habitat.
- Amount of quality riparian habitat protected and/or developed.
- Amount of suitable nesting and important foraging areas protected and/or acquired.

Alternatives C, D, E, and the PRMP would provide the greatest amount of the above habitats in the long term.

Overall effects of Alternatives NA, A, B, and actions on other lands in the planning area would likely maintain current limited levels of peregrine falcon habitat. Based on current OFPA riparian rules, peregrine falcon habitat is not expected to increase from already limited levels on private lands in the short and long term. Since additional older forest and riparian protection would be available under Alternatives C, D, and E (assuming no change in peregrine falcon habitat on private lands), the cumulative effects would result only in slightly higher amounts of peregrine falcon habitat and populations within the planning area. From a western Oregon perspective, similar levels of habitat protection on other federal lands (e.g., National Forests and other BLM districts) would tend to result in modest increases in peregrine falcon habitat and populations over time.

Northern Spotted Owl

Information on the habitat and populations of the northern spotted owl is discussed in Chapters 3 and 4 of the SEIS. The discussions in this EIS will incorporate the SEIS by reference and further supplement SEIS information by subsequent discussions specific to the Coos Bay planning area.

Within the planning area, the primary land management activity affecting spotted owl habitat is timber management. Timber harvest may affect habitat suitability by removing stands of trees under a regeneration harvest prescription, or it may be used for the long-term benefit of habitat through selective cutting (thinning) of individual trees to promote tree growth and habitat diversification.

Other BLM-conducted or BLM-authorized activities that could affect spotted owls or their habitat include: mining, road construction, or other activities that remove or alter coniferous forests; blasting or other types of activity generating loud noise that could disturb nesting and ultimately reproductive success; granting of rights-of-way or road use permits that could lead to habitat loss on federal and non-federal lands; and land exchanges that transfer habitat to other ownership which would then be subject to timber harvest, land development, or other activity contributing to habitat loss. Conversely, land exchanges could transfer suitable habitat to federal ownership to be managed for the conservation of the species, particularly where the transfer would block up federal ownership.

Effects on Suitable Habitat

Aerial photography and timber inventory data were used to evaluate the BLM-administered forest stands in the planning area. Based on habitat information in the Interagency Scientific Committee report (Thomas et al. 1990), the following two categories of suitable spotted owl habitat were identified:

> **Habitat 1** - Comprised of coniferous forest stands that satisfy the full complement of daily and annual needs of the owl for nesting, roosting, and foraging. These stands have a multilayered canopy of several species of coniferous trees with large trees in the overstory and an understory of shade-tolerant conifers and hardwoods. The canopy closure exceeds 70 percent. There is a significant measure of decadence in the stand resulting from the occurrence of snags and broken-topped live trees along with dwarf mistletoe infections. The forest floor has substantial accumulations of large down woody material in the form of fallen trees.
>
> **Habitat 2** - Comprised of coniferous forest stands, and some hardwood stands that provide roosting and foraging opportunities for spotted owls, but lack the necessary structure for consistent nesting. The roosting and foraging qualities are less than those described for Habitat 1 due to the reduced quality or complete absence of one or more of the components listed above (for example, the absence of large trees in the overstory or a reduced amount of down woody material on the forest floor). Habitat 2 stands generally have less diversity in the vertical structure and have either limited or poorly defined multilayered canopy structure. The understory is somewhat open, allowing for owl movement and foraging. Canopy closure generally exceeds 70 percent.

Currently there are approximately 93,000 acres of Habitat 1 and 24,000 acres of Habitat 2, for a total of 117,000 acres of suitable habitat within the planning area. There is a concern that large expanses of Habitat 2, without any inclusions of Habitat 1 to provide nesting groves, would not provide the same level of habitat suitability as if there were a mixture of the two habitat types. Within the planning area and under all alternatives, there would be interspersion of the two types of habitat due to riparian buffers, Timber Production Capability Classification non-suitable lands, natural vegetation patterns, past harvest patterns, and other lands not available for timber management. Based on this assumption, the two categories were combined for all analysis purposes.

Future habitat suitability was estimated by aging existing stands and projecting the location and timing of future harvests. The projection process used the ten-year timber management scenario for the short term and random selection from lands available for harvest in each alternative for the longer term. Also, the projection process considered the effects of silvicultural prescriptions such as density management.

The projected development of future spotted owl habitat over time is given in Table 4-18. In estimating the rate of development of future habitat, forecasts were more conservative for habitat development on existing stands regenerated following timber harvest. The conservative approach was used in these areas due to their current lack of large trees and snags and their typical single-layered, evenly-spaced, closed-canopy conditions.

It was assumed that density management in the restoration and retention blocks in Alternative C would not negatively affect attainment or retention of suitable habitat condition. Such harvests could accelerate development of suitable habitat, but the success rate of such treatments is unknown at this time.

Within the Late-Successional Reserves of the PRMP, it was assumed that harvest would occur only when the treatment would be judged to result in beneficial effects to spotted owl habitat. The intent of any prescriptions would be to accelerate the development of old-growth forest characteristics, which should also enhance spotted owl habitat.

The analysis assumed that, in the future, nonfederal lands would have no suitable habitat. Although this is a worst case scenario, it would likely be true for the vast majority of those lands as they are highly likely to be managed on harvest rotations ranging from 50 to 80 years. These short rotations would yield little, if any, habitat capable of sustaining significant numbers of reproducing spotted owls. An exception to this may be the adjoining Elliott State Forest which may provide long-term habitat for a substantial number of spotted owls.

Current acres of spotted owl habitat and future owl habitat projected for the district, by alternative, are shown in Table 4-18. The data was stratified by spotted owl physiographic provinces (Thomas et al. 1990, USDI 1991). The planning area occurs within the Coast Range and Klamath Provinces.

Since the NA Alternative is not mapped in BLM's Geographic Information System data base, habitat data could not be calculated, but its outcome would be similar to Alternative B.

Effects on Suitable Habitat Within the Coos Bay District

Habitat conditions for spotted owls would change over time under all alternatives. Under all alternatives, suitable habitat would decline on BLM-administered land over the short term, and in all Alternatives except E and the PRMP throughout the first five decades. Between the fifth decade and tenth decade, all alternatives would show some recovery in the amount of suitable habitat, although the recovered levels for Alternatives A and B would be relatively minor. Alternatives C, D, and E and the PRMP would result in significant long-term increases above current levels of suitable habitat. The amounts of suitable habitat provided in the long term by Alternatives A and B would be much lower and would not be expected to maintain clusters of owl sites, produce consistent occupancy of sites, or provide sites surrounded with adequate habitat acres. In the long term, under Alternatives A, B, and NA, spotted owl populations in Oregon would depend on habitat located on U.S. Forest Service lands for survival. Suitable habitat by alternative is shown in Table 4-18. For the purposes of comparison, the NA was assumed to be similar to Alternative B.

Alternatives C, D, E, and the PRMP would provide substantial amounts of suitable habitat in the long term, although only D and the PRMP are specifically designed to provide areas where clusters of sites would be maintained. At 100 years, the PRMP provides the greatest acreage of suitable habitat, followed closely by Alternatives C and E. In C, the habitat levels result from the management prescription specifying regeneration harvests of younger stands for the first three decades. This type of harvest results in a pulse of suitable habitat between 70 and 100 years in the future. This phenomenon—along with the assumption that high retention harvest will retain suitable habitat—results in a high level of suitable habitat. (It should be noted that the untested nature of Alternative C management indicates higher levels of uncertainty than the projected habitat acres will be attained.) The effects of this habitat pulse would be diminished over time, and eventually acres of suitable habitat under Alternative C would stabilize at a level below Alternative E but above Alternative D.

For Alternative C, the suitable habitat would be distributed throughout the planning area in the long term. It is possible that larger blocks would occur around the restoration and retention blocks or within the corridors, but there is no way to project precisely how the habitat would be distributed in the landscape. Approximately 68 percent of the suitable habitat under this alternative would be in managed forest stands, under either the high or low retention regimes.

The PRMP would yield the largest amount of suitable habitat in the long term. In this alternative, approximately 17 percent of the BLM-administered

Table 4-18. Suitable Spotted Owl Habitat on BLM-administered Lands in the Planning Area by Alternative (1,000 acres)

Current[1]	
Coast Range Province	96
Klamath Province	21
Total	117

			Alternatives				
	PRMP	NA[2]	A	B	C	D	E
After 10 Years							
Coast Range Province	93		55	62	89	94	96
Klamath Province	19		18	18	18	18	18
Total	112		73	80	107	112	114
After 50 Years							
Coast Range Province	125		25	40	25	91	113
Klamath Province	25		6	13	5	15	26
Total	150		31	53	30	106	139
After 100 Years							
Coast Range Province	226		34	51	213	135	164
Klamath Province	34		7	14	39	12	29
Total	260		41	65	252	147	193

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[1] Current habitat includes approximately 79,200 acres of Habitat 1 in the Coast Range Province and 13,200 acres of Habitat 1 in the Klamath Province.

[2] Acreage for the NA Alternative not available due to lack of 10-year scenario.

forest lands within the planning area would be available for timber management. Suitable habitat would dominate across the planning area with unsuitable habitat occurring only on the more scattered BLM-administered lands and in patches in the larger blocks of BLM ownership. The vast majority of suitable habitat would be in unmanaged stands.

The PRMP would provide approximately 35 percent more suitable habitat in the long term as Alternative E (see Table 4-18). Under Alternative D, approximately 60 percent of the suitable habitat would occur within the Habitat Conservation Areas. Likewise, in the PRMP, habitat would be concentrated within the Late-Successional Reserves, although substantial habitat would occur in the Matrix in Riparian Reserves. This relative concentration of habitat within large areas would result in a lower degree of habitat fragmentation within the Habitat Conservation Areas and Late-Successional Reserves, respectively. Under Alternative D, suitable habitat outside the Habitat Conservation Areas would be more scattered and fragmented than in Alternatives C, E, and the PRMP. The suitable habitat within the Habitat Conservation Areas in Alternative D and the Late-Successional Reserves in the PRMP would be unmanaged.

In conclusion, all alternatives reduce the amount of suitable habitat available in the short term. The short-term habitat loss is most acute in Alternatives A and B.

Alternatives A and B would provide very little suitable habitat in the long term with little clumping of acres to facilitate habitat for clusters of owl pairs. Alternative D would provide more total suitable habitat in the long term than currently available. Alternative D would concentrate more suitable habitat in large areas to minimize fragmentation, while Alternatives C and E would distribute suitable habitat across the landscape. The PRMP would provide the highest level of habitat in the long term in a mosaic of both concentrated habitat blocks (Late-Successional Reserves) and Riparian Reserves which occur on the lands between the habitat blocks.

Effects on Suitable Habitat Within Western Oregon

Based on the data in the Final Draft Spotted Owl Recovery Plan, BLM-administered lands currently provide approximately 14 percent of the suitable owl habitat in the region (Washington, Oregon, and northern California) compared with 74 percent on Forest Service lands (USDI FWS 1992). In Oregon, approximately 25 percent of suitable habitat occurs on BLM-administered lands and 70 percent occurs on Forest Service lands. The remaining 5 percent of habitat occurs on other federal, state, tribal, and private lands.

As discussed above and shown in Figures 4-4 and 4-5 and Table 4-19, in western Oregon Alternatives A and B would provide the least suitable habitat in the short and long term. Compared to the amount projected for Forest Service lands, the BLM would not contribute substantial habitat for spotted owls in the state under either of these alternatives.

Alternative C would provide the greatest amount of suitable habitat in the long term, 31 percent as much as projected for Forest Service lands. The PRMP would provide the second greatest amount of suitable habitat in the long term, but would only be approximately 30 percent as much as is projected for Forest Service lands. Alternatives D and E would contribute smaller acreages—22 and 28 percent of the Forest Service projections, respectively. The actual percentages on BLM-administered lands in Oregon are higher than those calculated because the Forest Service projections include suitable habitat in the California portion of the Klamath Province.

The contribution of BLM-administered lands to the present and projected availability of suitable habitat in the different provinces varies substantially (see Table 4-19). BLM-administered lands are most important in the Coast Range, where these lands currently contain more suitable habitat than Forest Service lands. Under Alternatives A and B, suitable habitat on BLM-administered lands in the Coast Range would be reduced significantly from current acres.

Long term in the Coast Range under the PRMP, BLM-administered lands would produce more acreage of suitable habitat than currently exists. Alternatives C, D, and E would produce fewer acres of suitable habitat in the Coast Range province compared to the PRMP. As shown in Table 4-19, except for the Coast Range, there is a smaller relative contribution of BLM-administered lands to suitable spotted owl habitat in other provinces in the long term compared with Forest Service lands.

Effects on Dispersal Habitat

Habitats 1 and 2—which provide for nesting, roosting, and foraging habitat—are concentrated in the Habitat Conservation Areas in Alternative D and the Late-Successional Reserves of the PRMP.

Table 4-19 . Western Oregon Spotted Owl Habitat: BLM and USFS (in 1,000 acres)

Decade Province	USFS [1]	BLM
Current		
E. Cascades	419	19
Klamath	421	354
W. Cascades	1,780	281
Coast	239	310
Total	2,859	963

		BLM Alternatives					
		PRMP	A	B[2]	C	D	E
After 10 Years							
E. Cascades	n/a [3]	18	12	13	14	14	19
Klamath	n/a	338	79	85	314	328	348
W. Cascades	n/a	258	198	210	262	260	277
Coast	n/a	287	190	208	272	290	290
Total	n/a	901	479	516	862	892	934
After 50 Years							
E. Cascades	n/a	17	1	6	22	9	36
Klamath	n/a	392	55	129	297	315	483
W. Cascades	n/a	284	38	96	178	236	320
Coast	n/a	415	58	119	154	304	321
Total	n/a	1,108	152	350	651	864	1,160
After 100 Years							
E. Cascades	1,062[4]	20	1	7	39	25	42
Klamath	1,026	496	65	62	596	442	588
W. Cascades	2,618	389	50	119	454	286	402
Coast	554	675	82	151	558	402	431
Total	5,260	1,580	198	339	1,647	1,155	1,463

[1] USFS current owl habitat values estimated from unpublished data in FSEIS data files.

[2] The NA Alternative was not included in GIS, so a separate analysis was not conducted. NA is assumed to most closely resemble Alternative B.

[3] n/a = Data not available.

[4] 100-year owl habitat projections on USFS land estimated on the assumption that all reserved acres would provide habitat and no habitat would be provided by Adaptive Management Areas or Matrix lands.

Figure 4 -4. Changes in Suitable Owl Habitat on BLM-Administered Lands in Western Oregon

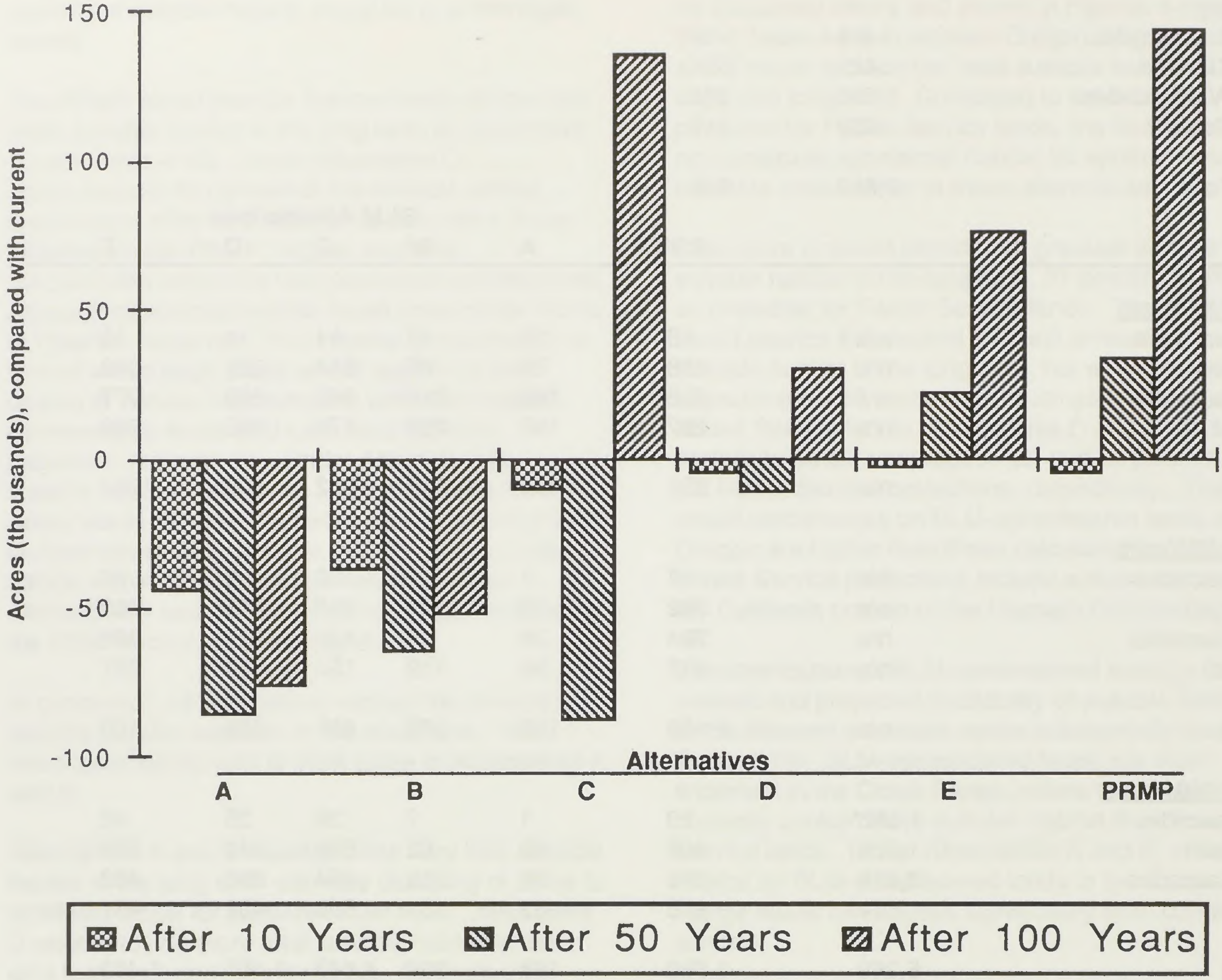
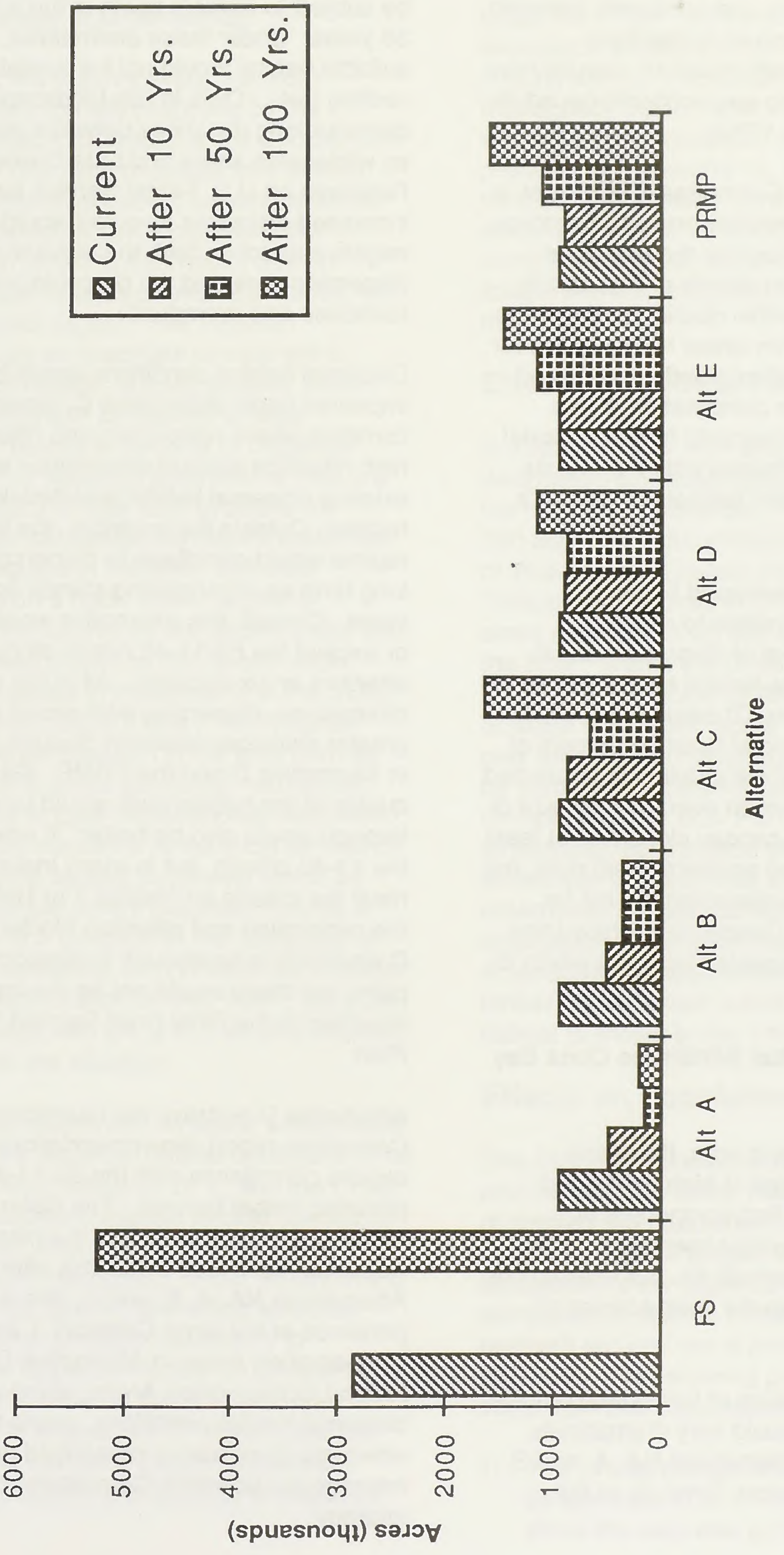


Figure 4 -5. Total Suitable Owl Habitat (acres) in Western Oregon on Forest Service and BLM Lands



Note: Forest Service Suitable Habitat Current and After 10 Years Assumed to be the Same

Also of importance is the condition of the forest vegetation between the large blocks of suitable habitat; this vegetation serves as dispersal habitat for owls. In the PRMP, the Riparian Reserves contribute significantly to dispersal habitat and may also provide an added measure of nesting, roosting, and foraging habitat. Provision of forest habitat to permit movement of juvenile and adult owls between nest habitat clusters is important to facilitate replacement of deceased individuals by recruits from the pool of dispersing young and nonterritorial adults (Thomas et al. 1990, USDI 1992).

The Interagency Scientific Committee (Thomas et al. 1990) determined that under their proposed strategy, adequate dispersal habitat across the managed landscape was comprised of stands of high quality old-growth forest located within riparian buffer strips, sensitive soil areas and other areas not available for timber management, and other stands of mid- and late-successional forest. In combination, these stands afford some level of security to nonterritorial owls which exist in the landscape until they locate blocks of unoccupied suitable habitat and set up a territory.

The "50-11-40" rule was developed by the Interagency Scientific Committee to define a prescription for management of dispersal habitat under a strategy using large habitat blocks separated by distances of 8 to 12 miles (Thomas et al. 1990). The rule calls for maintaining at least 50 percent of the land outside nesting habitat clusters in a forested condition where stands have an average tree size of at least 11 inches dbh and canopy closure of at least 40 percent. Although based on limited field data, this method has been used for assessing habitat for dispersal of spotted owls. Quarter-townships (nine square miles) were the suggested scale on which to assess this standard.

Effects on Dispersal Habitat Within the Coos Bay District

Within the Coos Bay planning area, there are distributed patches and strips of high quality old-growth habitat to meet the first component of dispersal habitat in most quarter townships. This would be the case in all alternatives, but Alternatives NA, A, and B would result in the least amount of these habitat patches.

The dispersal habitat condition of forest land outside these patches and strips would vary dramatically among the alternatives. Alternatives NA, A, and B would very likely result in most, if not all, of the quarter townships within the planning area not meeting the 50-11-40 rule. This is due to the large amount of acreage available for timber management and a 60-year harvest rotation. Under these alternatives, dispersal habitat would be attained in managed stands approximately 40 years after regeneration harvest, but most of these stands would be subject to harvest again in the subsequent 20 to 30 years. Under these alternatives, large blocks of suitable habitat would not be available for clusters of nesting owls. Owls in this landscape would need to disperse long distances between reserve areas such as wilderness areas and Late-Successional Reserves on U.S. Forest Service lands. The increased distances involved would likely have a negative effect on both the survival rates of dispersing owls and the percentage that establish territories and reproduce.

Dispersal habitat conditions would be substantially improved under Alternative C, especially within the corridors where restoration and retention blocks and high retention silvicultural regimes would retain existing dispersal habitat and develop additional habitat. Outside the corridors, the low retention regime would contribute to dispersal habitat in the long term as regenerating stands aged beyond 40 years. Overall, this alternative would probably meet or exceed the 50-11-40 rule in all quarter townships after five or six decades. As in the previous alternatives, dispersing owls would be moving greater distances between clusters of pair sites than in Alternative D and the PRMP. Generally, the quality of the habitat owls would be dispersing through would also be better. It would not only meet the 11-40 criteria, but in many instances would also meet the criteria for Habitat 1 or Habitat 2. Some of the restoration and retention blocks under Alternative C would be large enough to support reproductive pairs, but these would not be the large blocks specified in the Final Draft Spotted Owl Recovery Plan.

Alternative D portrays the Interagency Scientific Committee report recommendations and would require compliance with the 50-11-40 rule when planning timber harvest. The distance owls would be required to disperse across the managed landscape would be much less under this alternative than under Alternatives NA, A, B, and C; this is due to the presence of the large Category 1 and 2 Habitat Conservation Areas in Alternative D. The large Habitat Conservation Areas, along with the improved dispersal habitat conditions, would facilitate adequate dispersal as prescribed under the Interagency Scientific Committee conservation strategy.

For Alternative E, dispersal habitat is likely to recover similarly to Alternative D and ultimately exceed the 50-11-40 rule on the majority of quarter townships. In most cases, the condition of the dispersal habitat would be far superior to the minimum levels found in Alternative D. Any quarter township not meeting the rule would likely occur along the valley margins and contain below average BLM ownership.

Under the PRMP, the reserve system is more extensive than that originally proposed by the Interagency Scientific Committee or the Spotted Owl Recovery Team. This system results in a smaller land area where dispersal habitat conditions would need to be considered; in some situations the reserves are much closer to each other than in Alternative D, which reduces or even eliminates, the concern for dispersal habitat. The Riparian Reserves, which are an important component in providing dispersal habitat, are significantly larger under the Proposed RMP compared to other alternatives. This results in benefits to dispersal habitat conditions by reducing potential harvest unit sizes and the amount of total land available for harvest. The dispersal habitat conditions under the PRMP will be adequate in the short term and improve over time on a track similar to that of Alternative D. In the long term, conditions under the PRMP would exceed projected conditions under Alternative D. As stated in Appendix G of the SEIS, "the elements of Alternative 9 (the PRMP) should enhance the dispersal situation in the long term as habitat grows back in areas previously harvested, both in and outside of Late-Successional Reserves. It would also reduce concerns in the short term since the amount of habitat subject to harvest would be less especially in areas where dispersal may be a concern." If there is a question of the adequacy of dispersal habitat conditions in a given locale in future planning and implementation of the PRMP, the BLM will informally consult with the U.S. Fish and Wildlife Service to evaluate the situation.

In conclusion, Alternatives NA, A, and B would result in the least effective dispersal habitat conditions of all the alternatives. Alternatives C, D, E, and the PRMP would provide adequate dispersal habitat conditions in the long term, but Alternatives C, E, and the PRMP provide more total acres. Under Alternative D and the PRMP, most quarter townships would be managed at the minimum level necessary to maintain or restore dispersal habitat on at least 50 percent of BLM-administered lands outside the reserves inherent in Alternative D. Both D and the PRMP would follow the same pattern of habitat availability, but the quality and quantity of dispersal habitat in the PRMP would ultimately exceed Alternative D.

The BLM checkerboard ownership pattern may yield cumulative dispersal habitat conditions that constitute less than 50 percent of the landscape. It is unknown if conditions in the checkerboard pattern under the PRMP will be sufficient to provide for successful dispersal of owls between suitable nesting areas. This situation was recognized by the Interagency Scientific Committee (Thomas 1990) when they recommended that the 50-11-40 rule be prorated by ownership for the first three years and then be re-evaluated "as it applies to multiple-ownership areas." The BLM will monitor habitat conditions and owl dispersal in an effort to provide insight into the adequacy of habitat conditions under the PRMP.

Effects on Critical Habitat

In 1992, the U.S. Fish and Wildlife Service designated 6.5 million acres as Critical Habitat for the northern spotted owl. The acres are arranged in 190 separate Critical Habitat Units across the states of Washington, Oregon and California. There are 76 Critical Habitat Units in Oregon totaling 3,257,000 acres of which 1,066,000 acres are administered by the BLM. Within the Coos Bay planning area, there are 6 Critical Habitat Units with a combined BLM acreage of 137,350 acres. All proposed actions that may affect lands designated as critical habitat would be consulted upon informally and, if necessary, formally with the U.S. Fish and Wildlife Service. For all alternatives, the BLM will not implement any action that the U.S. Fish and Wildlife Service determines through consultation would result in the destruction or adverse modification of critical habitat. A sensitivity analysis of the effects of excluding all timber management activities from designated critical habitat is shown in the Timber section of Chapter 4.

Effects on Populations

This EIS incorporates by reference the discussion and conclusions of the Final SEIS relating to analysis of spotted owl population trends in Appendix J3 and Chapters 3 and 4 (pages 212-237). An indepth discussion of the significance and context of demographic studies in the conservation of the northern spotted owl is provided in the FSEIS (pages 212-235). The following points summarize the key items from that discussion.

1) The overall results of the demographic analysis by Burnham et al. (1994) were not unexpected since the data was gathered during a time of

habitat decline that was of sufficient concern to serve as a primary reason for the listing of the owl as a threatened species. Given this, it would have been surprising if the population had shown a stable or increasing trend.

2) The result that should be of most concern is the declining rate of adult survival. It is not possible to know with certainty what specific actions could be implemented to reverse the declining rate of adult survival shown in the demographic studies. This information does argue for a relatively conservative plan for owls, but whether the demographic results of these studies call for any more measures than what are contemplated in the proposed RMP is not known. These data, however, would support a decision to adopt a markedly more conservative approach to owl management in the PRMP (USDI unpub., Thomas et al. 1990).

3) Concerns were raised about whether the population of northern spotted owls could survive over the transition period until habitat recovery occurred. These were based largely on the finding of declining survival rates for adult female owls and the contention that the population may already have, or is about to pass, a threshold from which it cannot recover. In order for the spotted owl to be at or near such a threshold that would be passed resulting in extirpation of the species from large parts of its range as a result of harvest under the PRMP, the following four conditions would have to be met.

   a) Owl populations would have to be declining throughout all or most of their range.

   b) Within the general areas where overall declines were seen, there would have to be no significant source areas that could provide for demographic rescue.

   c) The factor, or factors, causing the decline would have to be operating in a similar fashion throughout all or most of the range.

   d) The decline would have to continue as a function of habitat conditions until owl populations sizes and densities were reduced to the point that the populations could not recover.

There is additional discussion on each of these points in the FSEIS. This discussion concluded that:

1) While there is strong reason to believe that the owl populations have declined across much of their range, there is ample reason to believe that the pattern of population change is not the same everywhere.

2) There are areas within the range of the owl with characteristics thought to be important to the productivity and stability of local populations and that such areas could act as sources for the owl population even in the face of an overall decline. Many of these areas are within the Late-Successional Reserves designated by the PRMP.

3) It is unlikely that a single factor, with the exception of habitat loss, is primarily responsible for the declines in the owl population across the range. With the full range of environmental heterogeneity represented within reserves, there is reason to believe that owl population performance will vary in both positive and negative ways throughout the range. Given this it would be inappropriate to make a simple extrapolation from the current estimated rates of decline in the owl population to single future projection of irreversible decline.

4) There is no part of the demographic studies that link them to either historic or projected rates of decline, and there is no other evidence that the owl population losses will accelerate in the future or no empirical or theoretical basis for believing that the current habitat condition or condition of the owl population represents a unique threshold point.

The Draft RMP/EIS utilized a spatially explicit population model by McKelvey (1992) to evaluate the likely response of a model-generated owl population to a varying set of habitat situations characteristic of the range of alternatives. This model was subsequently used in the SEIS analysis. This EIS incorporates the discussion of that application found in Appendix J3 of the SEIS. As stated in Appendix J3, "Our results support the conclusions reached by the FEMAT in assessing likelihood of habitat conditions to provide for stable and well-distributed populations (measured against the owl's historic range) on federal lands over both the short and long term." The authors also stated that "The FEMAT based their ratings on an assumption that the amount and distribution of habitat would be sufficient to support a large enough population of owls to prevent passing an extinction threshold. Our simulation results do not prove this assumption correct (nor could they), but they do lend support to it for Alternatives 1 and 9 under the most likely rule sets." The standards and guidelines of Alternative 9 were embraced by the PRMP.

Conclusion of Northern Spotted Owl Habitat Discussion

Analysis of the information on population levels and the quantity and arrangement of suitable habitat on the landscape indicated that the alternatives in this EIS would likely have different outcomes for sustaining owl populations on BLM-administered lands in western Oregon and contributing to the long term stability (recovery) of populations within the range of the owl. For Alternatives NA, A, and B the outlook for sustaining owls on the BLM-administered lands is very low, virtually eliminating any contribution to the overall spotted owl population stability in the region. For Alternatives C, D, E, and the PRMP, the likelihood of sustained populations on BLM-administered lands is greatly increased and there would be an important contribution to the overall spotted owl population stability in the region.

The contribution to recovery associated with each alternative varies because of the amount and distribution of suitable habitat and/or the amount and distribution of dispersal habitat in the first several decades of implementation. The level of contribution to the recovery of the spotted owl for Alternative D is about the same as implementation of the Final Draft Recovery Plan for the Northern Spotted Owl (USDI 1993). On the other hand, the PRMP would provide a somewhat higher level of contribution to the recovery of the owl than the Final Draft Recovery Plan. The PRMP contribution, as compared to D, is greater due to the large increase in suitable habitat that occurs.

In the long term, the PRMP will exceed Alternative D in amount of suitable habitat and overall habitat capability. The lower expectation of contribution under Alternative C results from the uncertainty that silviculture will be successful in recreating habitat over large portions of the landscape. Allocations under Alternative E perpetuate the habitat conditions of today and do not afford opportunity for regrowth of habitat in areas presently deficient, resulting in a habitat area of lesser extent than Alternatives C, D, and the Proposed RMP.

Bald Eagle

Bald eagle sites (including seven existing nest sites and several potential sites) identified under the Pacific bald eagle implementation plan (WDW 1989) would be protected under all alternatives. Assessment of effects on bald eagle habitat is based on the number of potential habitat sites (in addition to those identified in the implementation plan) that would be available under each alternative.

In the short term, Alternatives NA, A, and B would provide the fewest number of potential habitat sites because they provide less protection for old-growth and mature forests and riparian zones. In contrast, Alternatives C, D, E, and the PRMP would provide higher levels, based on increased protection of old-growth and mature habitat and riparian zones. Under all alternatives, bald eagle populations on BLM-administered land would probably remain at current levels due to protection of all existing and some potential habitat.

In the long term, the availability of suitable bald eagle habitat would also depend on the amount of habitat allowed to regrow into old-growth and mature forest habitat and riparian zones. Alternatives C, D, E, and the PRMP would provide some of this habitat in the long term whereas Alternatives NA, A and B would provide very limited potential habitat. Bald eagle populations would likely increase in the long term under Alternatives C, D, E, and the PRMP due to increased availability of mature and old-growth forest.

Cumulative effects of Alternatives NA, A, and B and actions on other lands in the planning area would likely maintain current low levels of bald eagle habitat and populations. Bald eagle habitat and populations are not expected to increase from already low levels on private lands in the short and long term. Since additional older forest and riparian protection would be available under Alternatives C, D, E, and the PRMP (assuming no change in bald eagle habitat on private lands), the cumulative effects would result only in slightly higher amounts of bald eagle habitat and populations within the planning area. From a western Oregon perspective, similar levels of habitat protection on other federal lands (e.g., national forests and other BLM districts) would tend to result in modest increases in bald eagle habitat and populations over time.

Snowy Plover

Assessments of impacts on snowy plover habitat are based on the quantity and the quality of existing and potential snowy plover breeding and brood-rearing sites that would be maintained, acquired, or developed under each alternative. Snowy plover sites on BLM-administered lands at New River and the North Spit of Coos Bay are currently protected by Bureau policy and the Endangered Species Act.

Conflicts with snowy plover habitat do not involve timber management. Some impacts would occur on the North Spit and in the New River areas where existing or potential snowy plover nesting and brood-rearing habitat could be impacted by recreational use.

European beachgrass encroachment would reduce the nesting habitat for the snowy plover and increase predation of eggs and chicks from crows, skunks, and other species. Management of beachgrass would be addressed in activity plans for both the New River and North Spit ACECs.

In the short and long term, existing snowy plover habitat would remain unchanged under Alternatives NA, A, and B, and could be enhanced under Alternatives C, D, E, and the PRMP where portions of both the North Spit and New River areas would be managed as ACECs. These four alternatives also provide for additional land tenure adjustments to be made for valuable non-timber resources (e.g., snowy plover habitat) using timber-producing lands as trading blocks.

Table 4-20 depicts effects that would occur on present and potential important snowy plover habitat under each alternative.

Marbled Murrelet

The assessment of impacts on the marbled murrelet focuses on the amount of suitable nesting habitat that would be available within 50 miles of the Pacific Coast in the short and long term. (Suitable nesting habitat is generally characterized as stands that are 130-years or older, with overstory trees 20 inches dbh or better, and with at least a 40 percent canopy closure.) Table 4-21 displays, by alternative, the current estimated acres of suitable nesting habitat, the acres of habitat available after timber harvest over the first decade, and the acres of land that would be expected to provide nesting habitat in the long term.

In the short term, all alternatives would remove suitable nesting habitat. Impacts would be expected to be greater under Alternatives NA, A, and B and less under Alternatives C, D, E, and the PRMP as a result of greater protection levels for the older forests in the four latter alternatives. All stands occupied by murrelets will be protected under the PRMP. To identify occupied stands, all action areas within 50 miles of the coast subject to degradation of suitable nesting habitat would be surveyed to determine the murrelet occupancy status. For all alternatives, protection would be afforded to known occupied murrelet sites under the provisions of the Endangered Species Act.

In the long term, availability of suitable nesting habitat would depend on the amount of older forest protected and the amount that will grow into suitable nesting habitat condition. It would also be influenced by the success of developing old-growth characteristics through silviculture treatments that are planned under some alternatives, particularly C. Alternatives C, D, E, and the PRMP would provide varying levels of nesting habitat in the long term, whereas Alternatives NA, A, and B would provide very limited suitable nesting habitat. Based upon availability of nesting habitat, marbled murrelet populations would likely increase in the long term under Alternatives C, D, E, and the PRMP due to the increased amounts of habitat.

The cumulative effects of Alternatives NA, A, and B, and the actions on other land ownerships would likely result in further declines in marbled murrelet populations due to the lower amounts of older forest having suitable nesting habitat conditions. Murrelet habitat and numbers of birds are not expected to increase from already low levels on private lands in the short or long term. Although additional suitable nesting habitat would be provided under Alternatives C, D, E, and the PRMP, the cumulative increase would result in only slightly higher amounts of habitat and numbers of murrelets in the planning area. The SEIS stated, “When all major factors affecting the species are taken into account, including at-sea and land ownership patterns, the murrelet panel concluded there is between a 50 and 75 percent likelihood that the murrelet population on federal lands will be stable and well distributed after 100 years, regardless of the alternative selected.” Accordingly, from a western Oregon perspective, under the PRMP, the levels of protection projected for all federal lands would result in only a moderate increase in habitat and numbers of murrelets over time.

The U.S. Fish and Wildlife Service has proposed the designation of approximately 543,000 acres of BLM-administered land in western Oregon within the range of the murrelet as critical habitat. Although no quantitative assessment or sensitivity analysis was conducted, this designation is estimated to involve approximately 142,000 acres in the Coos Bay planning area. This would have the greatest impact on the implementation of Alternatives NA, A, and B as proposed; moderate impact on C and D; and the

Table 4-20. Present and Potential Snowy Plover Habitat on BLM-Administered Lands by Alternatives

Habitat	Condition	PRMP	NA	A	B	C	D	E
Present								
Breeding/brood rearing sites	ST	+	0	0	0	+	+	+
	LT	+	0	0	0	+	+	+
Potential								
Breeding/brood rearing site areas	ST	+	0	0	0	+	+	+
	LT	+	0	0	0	+	+	+

Abbreviations used in this table:
0 = No change
- = Declining
+ = Improving
ST= Short Term
LT= Long Term

Table 4-21. Marbled Murrelet Habitat in the Coos Bay BLM District in the Short Term (10 years) and Long Term (100 years) by Alternative (in thousands of acres)

	Alternatives					
	PRMP	A	B	C	D	E
Current 100						
10 years	96	62	69	92	93	95
100 years	265	12	15	60	113	217

Note: The No Action Alternative is assumed to be similar to Alternative B.

least impact on Alternative E and the PRMP. Under all alternatives, the BLM will conference with the U.S. Fish and Wildlife Service on all actions that 'may adversely affect' proposed critical habitat. If the murrelet is designated, the BLM will consult on all proposed actions that 'may affect' its critical habitat. The BLM will not carry out any action that is determined by the U.S. Fish and Wildlife Service to adversely modify or destroy designated critical habitat.

Aleutian Canada Goose

Assessments of impacts on Aleutian Canada goose habitat is based on the quantity and quality of existing and potential Aleutian goose habitat (primarily feeding and resting habitat) that would be maintained, acquired, or developed under each alternative. Aleutian goose habitat at New River is currently protected by Bureau policy and the ESA since the Aleutian goose is a listed threatened species under the federal ESA criteria.

Few, if any, conflicts would exist between Aleutian goose habitat goals and timber management goals under any alternative. The highest potential for conflict would be between Aleutian goose habitat management and some forms of recreational use of existing and potential Aleutian goose resting and feeding habitat in the New River area and other areas along the Oregon coast. Positive impacts to Aleutian goose habitat could occur with vegetative management (e.g., grazing or prescribed fire).

In the short term, Aleutian goose habitat would remain the same or could be slightly degraded under Alternatives NA, A, and B which do not provide for adjustments to land tenure for this species. Long-term negative impacts could be significant under Alternatives A and B due to off-site development of private lands that would not be acquired under these alternatives. Possible land tenure adjustments throughout the planning area under Alternatives C, D, E, and the PA would be more beneficial to the Aleutian goose and its habitat where conflicts exist, or may occur, along the Oregon coast in the long term.

Other Special Status Animals

In general, other special status species (federal candidate, state-listed, Bureau sensitive) (see Table 4-22) would be less impacted by BLM actions under Alternatives C, D, E, and the PRMP than under Alternatives NA, A, and B. This is primarily due to less timber harvest and fewer other intensive activities under the former alternatives. However, under all alternatives, special status species that occur in areas managed primarily for timber production could be adversely affected by timber harvest and associated practices. In these areas, BLM would determine whether a proposed action would contribute to the listing of affected species prior to the action. If an action was determined to contribute to listing, the action would be modified.

A number of species (e.g., some migratory and oceanic species) are not expected to be affected under any of the alternatives primarily because of their limited habitat and/or distribution on BLM-administered lands. These species are listed at the end of Table 4-22. Not enough information was available to assess the effects of the alternatives on invertebrates (e.g., caddisflies, butterflies, beetles, etc.). The following narratives refer to species for which impacts are anticipated.

Northern Red-Legged Frog (Federal Candidate 2)

Populations of red-legged frogs are likely to be adversely impacted under Alternatives NA, A, and B (refer to discussion under amphibians in the Wildlife Section of Chapter 4). Progressively better red-legged frog habitat would be expected under Alternatives C, D, E, and the PRMP in the long term due to wider riparian buffer widths and improved condition of riparian habitats in the form of older seral stage forests. Aubry and Hall (1991) found that red-legged frogs were statistically most abundant in mature stands and least abundant in young stands. Bury et al. (1991) also concluded that red-legged frogs were most abundant at lower elevations with flatter slopes.

Global effects unrelated to forest management—such as acid precipitation and ozone thinning—could potentially affect amphibians.

Mountain Quail (Federal Candidate 2)

Alternatives NA, A, and B would likely provide abundant habitat given projections for increased early seral stage habitat. This analysis assumes that sufficient shrub and herbaceous species would persist in early seral stages after site preparation. Alternative C would likely benefit the species due to the variety of silvicultural systems employed, assuming sufficient shrub and herbaceous vegetation is available on harvested units.

Table 4-22. Impacts to Other Special Status Animal Species During the Short term (10 years) and Long Term (100 years) Under the Various Alternatives [1]

	Alternatives						
Species	PRMP	NA	A	B	C	D	E
Federal Candidate							
Amphibians							
Northern red-legged frog	0/++	-/-	-/-	-/-	0/+	0/+	0/+
Del Norte Salamander	0/++	-/-	-/-	-/-	0/0	0/+	0/0
Western Pond Turtle	++/++	-/-	-/-	-/-	+/0	+/+	+/+
Siskiyou Mountains Salamander	0/++	-/-	-/-	-/-	0/0	0/+	0/+
Birds							
Mountain quail	0/-	0/-	0/+	0/+	0/-	0/-	0/-
Mammals							
Pacific fisher	-/++	-/-	-/-	-/-	-/0	-/+	0/0
Townsend's big-eared bat	+/+	-/-	-/-	-/-	0/0	0/0	0/0
Bureau Sensitive							
Mammals							
Pacific Fringe-tailed bat	0/++	-/-	-/-	-/-	0/+	0/+	0/+
Bureau Assessment & Tracking							
Amphibians							
Clouded salamander	0/+	-/-	-/-	-/-	0/+	0/+	0/+
Tailed frog	0/++	-/-	-/-	-/-	0/+	0/+	0/+
Southern Torrent	0/++	-/-	-/-	-/-	0/+	0/+	0/+
California Slender Salamander	0/++	-/-	-/-	-/-	0/0	0/+	0/0

Table 4-22. Impacts to Other Special Status Animal Species During the Short term (10 years) and Long Term (100 years) Under the Various Alternatives [1] (continued)

	Alternatives						
Species	PRMP	NA	A	B	C	D	E
Birds							
Black-backed woodpecker	-/+	-/-	-/-	-/-	-/+	-/+	-/+
Pileated woodpecker	-/+	-/-	-/-	-/-	-/+	-/+	-/+
Purple martin	0/++	-/-	-/-	-/-	0/0	0/+	0/
Western bluebird	0/++	-/-	-/-	-/-	0/+	0/+	0+
Mammals							
Marten	-/++	-/-	-/-	-/-	-/0	-/+	0/

Abbreviations used in above table:
0 = No known effect
- = Negative effect
+ = Positive effect
++= Increased positive effects
— = Increased negative effects

Special Status Species for which no effects are anticipated under any of the alternatives:

Federal Endangered - Brown pelican, Blue whale, Finback whale, Right whale, Sei whale, Sperm whale, Grey whale, Humpback whale, Loggerhead sea turtle, Green sea turtle, and Leatherback sea turtle.

Federal Threatened - Northem sea lion, Pacific ridley sea turtle, and Sea otter.

Federal Candidate - Foothill yellow-legged frog, Harlequin duck, Spotted frog, Loggerhead shrike, White-footed vole, Gold Beach pocket gopher, and Pistol River pocket gopher.

Bureau Sensitive - Red-necked grebe, Burrowing owl, and Marten.

Bureau Assessment and Tracking - Bufflehead, Common loon, Dusky Canada goose, Fork-tailed storm petrel, Snowy egret, Merlin, Horned grebe, Lewis' woodpecker, Chum salmon, Painted turtle, Sharptail snake, Great egret, Cackling Canada goose, Ring-necked duck, lesser scarp, White tailed kite, Long-billed curlew, Caspian tern, Northern pygmy owl, Allen's hummingbird, Acom woodpecker, Black phoebe, Ring tail cat, Western toad, California mountain kingsnake, and Common kingsnake.

[1] Ratings are based on expected habitat/population impacts for the entire planning area. For any altemative, however, a positive impact could occur to a subpopulation or habitat area, even though negative impact is expected for the entire population of a species. The reverse situation could also be true.

[2] Petitioned species undergoing status review by the National Marine Fisheries Service. Species in this category are treated as federal candidate species by BLM.

Alternatives D, E, and the PRMP may have some adverse impacts on the species on BLM-administered land, primarily due to the emphasis on restoration of older forest communities at the expense of early seral stages. Plentiful habitat is expected, however, on adjacent private lands due to anticipated short timber harvest rotations. Refer to general discussion on effects of alternatives on upland gamebirds in the Wildlife Section of Chapter 4.

Northern Goshawk (Federal Candidate 2)

Alternatives NA, A and B would retain relatively little mature and old-growth habitat in the short and long term. As a result, northern goshawk populations would be expected to remain low or further decline. Alternatives C, D, E, and the PRMP (in increasing order of protection) would retain some or all of existing habitat and over the long term increase this habitat, resulting in an increase in goshawk populations in the long term.

Cumulative effects on northern goshawks would be detrimental under Alternatives NA, A, and B. They would be less detrimental under Alternatives C, D, E, and the PRMP due to greater retention of existing older forest and greater allowance for future stands to develop to older forest conditions on BLM-administered lands. Additional habitat would also be available on adjacent Forest Service land as a result of decisions made in the SEIS. Little habitat is anticipated on private lands.

Fish (Petitioned Species Treated by BLM as Federal Candidate 2)

Declines in petitioned and proposed stocks (Coho, winter steelhead, and Umpqua Basin Cutthroat trout) considered collectively are probably related to a variety of factors that have likely resulted in declines coastwide. Habitat for these stocks will likely improve under all alternatives (greatest under the PRMP) except A. Because of the mixed land ownership patterns and impacts of activities on nonpublic lands, it is not possible at this time to estimate the impacts of implementation of the RMP alternatives on individual fish stocks.

Pacific Fisher (Federal Candidate 2)

Intensive forest management under Alternatives NA, A and B are likely to have detrimental effects on fishers in the Coos Bay District. Alternative C would have questionable utility due to the scattered distribution of the old growth and mature stands in proposed restoration and retention blocks, and the uncertainty of high retention prescriptions to provide suitable habitat. Alternative D would provide potential habitat areas, coincident with the spotted owl HCAs, throughout the district in the long term. Alternative E, while protecting the best (oldest) habitat in the short term, likely would not provide the best distribution of habitat in the long term. The PRMP would provide the highest quality and most acreage of habitat in the long term.

Townsend's Big-eared Bat (Federal Candidate 2)

The Townsend's big-eared bat, like other bats, is very intolerant to disturbance—especially in the maternal colony. Under Alternatives NA, A and B, the protection level of winter hibernation sites is likely insufficient to protect this habitat. Alternatives C, D, and E would likely maintain the habitat, given seasonal stipulations to avoid disturbance. The PRMP provides the greatest protection for this species.

SEIS Special Attention Animal Species

The analysis of impacts of the proposed resource management plan also incorporates by reference the conclusions of the SEIS Appendix J2 regarding: arthropods, mollusks, amphibians and reptiles, birds, mammals other than bats, bats, and early successional species. In summary, the SEIS concluded that its Alternative 9 (which is essentially incorporated in the PRMP) would have the following consequences:

Fish

The SEIS identified 136 salmonid stocks at risk or of special concern within the BLM districts in western Oregon. Of these, a total of 65 stocks occur in streams managed by the Coos Bay District in the Smith, Umpqua, Coos, Coquille, Rogue, and smaller South Coast Coastal basins. These include coastal coho and coastal steelhead. The majority of these stocks (54) are found in coastal streams between and including the Pistol River on the south to the Umpqua River. SEIS Alternative 9 would result in a strong likelihood of providing sufficient aquatic habitat to support stable, well-distributed populations of coho salmon, fall and spring chinook salmon, summer and winter steelhead trout, sea-run cutthroat trout, and resident rainbow and cutthroat trout.

Arthropods

Alternative 9 would provide fairly high habitat protection to the various functional groups assessed in the SEIS compared to the other alternatives. Standards and guidelines which might increase the likelihood that necessary habitat components would be maintained were incorporated into Alternative 9.

Mollusks

Alternative 9 also provides fairly high habitat protection to mollusks. For example, Riparian Reserves are important to the maintenance of habitat for freshwater snails and clams, and Alternative 9 rated well for these species. In addition, standards and guidelines were incorporated into Alternative 9 to benefit the habitat components required by many of these species. Nonfederal lands are an important consideration for the persistence of some mollusks, and substantial risks of extirpation will remain even with significant conservation measures in place on federal lands. Species with especially high risk are associated with large rivers.

Amphibians

Alternative 9 ranks well in providing the necessary habitat components for amphibians. Standards and guidelines were incorporated into Alternative 9 which might benefit all amphibians assessed in the SEIS. For example, for the southern torrent salamander and tailed frog, Alternative 9 is expected to provide habitat protection from Riparian Reserve Scenario 1. Retention of coarse woody debris in the Matrix is expected to provide habitat protection for the clouded salamander, and the buffer provision will provide habitat protection for the Del Norte salamander and the Siskiyou Mountain salamander.

Birds

Alternative 9 is favorable to birds because it provides a set of allocations and management practices that produce the necessary habitat components for birds. Standards and guidelines incorporated into Alternative 9 will benefit the black-backed woodpecker. All of the birds considered in the SEIS occur on both federal and nonfederal lands. Some are neotropical migrants and migrate to Mexico or central America for the winter season. For all of these migratory species, habitat on the winter range is likely as important as breeding habitat in maintaining viable populations. No other standards and guidelines on federal land can provide habitat to mitigate the potential cumulative effects on these species from loss of habitat on nonfederal lands. Because the common merganser occupies low elevation waterways and riparian habitat primarily on nonfederal lands, its persistence cannot be adequately assured by any of the alternatives. No measure on federal habitat can provide habitat to mitigate the potential cumulative effects on this species from loss of riparian habitat on nonfederal lands.

Mammals Other Than Bats

Alternative 9 provides the necessary habitat components for those species assessed in the SEIS. Standards and guidelines were incorporated in Alternative 9 which will benefit all these species, including implementation of Riparian Reserve Scenario 1 and retention of coarse woody debris on Matrix lands. Other standards and guidelines include provision of spotted owl activity centers in the Matrix and the survey and manage guideline for the red tree vole. None of the species that occur within the planning area are highly restricted to nonfederal lands.

Bats

Alternative 9 will maintain and enhance the habitat components needed by bats in the district. Two standards and guidelines—including protection of caves and abandoned mines and other structures and retention of clumped green trees and snags in the matrix—would contribute to the protection of these species.

Early Successional Species

Alternative 9 would provide for a relatively low amount of acres of this successional stage on BLM-administered lands. The BLM-administered lands in the district occur within a broader landscape of nonfederal lands where substantial early-seral forests will be created through logging and other management activities. These lands may contribute to the maintenance of early-successional forest habitat over time.

Effects on Special Areas

Resource management impacts on existing and potential special areas would vary depending upon land allocations and management prescriptions proposed under each alternative. Table 4-23 depicts probable changes in the condition of special areas in the short term. Changes are compared to current resource conditions and based on the assumption that mineral exploration and development can be excluded and/or tightly controlled in the future. (See Table 2-6 in Appendix E for proposed management constraints in special areas, and Appendix Z for probable management activities and major consequences in special areas.)

Under the No Action Alternative (NA), nine potential special areas would not be designated and would be subject to varying degrees of protection and/or commodity development depending upon resource conditions or 1983 primary land use allocations. Some protection would be provided by conditions such as non-forest or fragile site and/or by allocations such as riparian management areas or older forest retention areas. Commodity values present outside these protective allocations would be available for development. In the short term, about 2,100 acres of timber would be harvested, and some, if not all, special values would be lost or damaged. Ten potential RNA cells would not be filled using BLM-administered land. There are no other known localities where these cells could be filled. The failure to maintain these cells in a natural condition would diminish, if not destroy, their values for research and for monitoring changes in unmanaged baseline areas for comparison to managed areas. By failing to gain knowledge of ecosystem functions, the quality of future management may be diminished.

Under Alternative A, eight potential special areas would be available for resource development activities such as road construction and timber harvest. These activities could cause the loss of, or damage to, special values for which the areas were designated or proposed for designation. In the short term, approximately 2,030 acres of timber would be harvested in one existing and seven potential special areas, and special values would be lost or damaged by ground and vegetation-disturbing activities. Ten potential RNA cells would not be filled using BLM-administered land. There are no other known localities where these cells could be filled. (See NA Alternative for consequences of not maintaining RNA cells.)

Under Alternative B, four potential special areas would be available to varying degrees of resource development depending upon primary land use allocations. In the short term about 1,070 acres of timber would be harvested, and some, if not all, special values would be lost or damaged. Seven potential RNA cells would not be filled using BLM-administered land. There are no other known localities where these cells could be filled. (See NA Alternative for consequences of not maintaining cells.)

Alternative C would make three potential special areas available to varying degrees of resource development depending upon primary land use allocations. However, because no timber sale harvest is planned in these three areas for the next ten years, no potential RNA cells would be lost.

Under Alternative D, no existing or potential special areas would be adversely impacted by resource development activities.

Under Alternative E, no existing or proposed special areas would be adversely impacted by resource development activities other than trail construction within Wassen Creek, North Fork Coquille River, Upper Rock Creek, North Fork Hunter Creek and Hunter Creek Bog. Trail construction is not expected to reduce the opportunities to conduct research or impact the ability to fill the RNA cells.

Under the PRMP, designated special areas would be protected by following site-specific management plans developed through the IDT process, by adhering to recommendations for the types of activities that are permitted or prohibited, and by enforcing constraints on the permitted activities.

Under the PRMP, an irreversible or irretrievable commitment of special area resources could occur if mineral activities are proposed that cannot be adequately regulated. Without regulation, the opportunity to protect special natural values in these areas could be lost.

Table 4-23 . Probable Changes in the Condition of Existing and Potential Special Areas

Special Area	PRMP	Probable Changes by Alternative[1] NA	A	B	C	D	E
Existing							
New River	0	0	0	0	0	0	0
Cherry Creek	0	0	0	0	0	0	0
Powers Environmental Education Area	0	0	-	0	0	0	0
Potential							
Wassen Creek	+	-	-	-	+	+	+
North Fork Coquille River	+	-	-	-	0	+	+
China Wall	+	-	-	-	0	+	+
Tioga Creek	+	-	-	-	0	+	+
North Spit	+	-	-	+	+	+	+
Upper Rock Creek	+	0	-	0	0	+	+
North Fork Hunter Creek	+	-	-	+	+	+	+
Hunter Creek Bog	+	-	-	+	+	+	+
North Fork Chetco	+	-	-	-	+	+	+

[1] Abbreviations used in this table:
0 = No change or negligible
- = Adverse
+ = Beneficial

Effects on Cultural Resources

The potential for impact upon sites and artifacts varies with the amount of surface-disturbing activity permitted under each alternative. Alternatives emphasizing maximum timber harvest/production (Alternatives A and B) and/or extensive motorized recreation would have a higher potential for impact on cultural values than alternatives emphasizing reduced timber harvest (Alternatives C, D, E, and the PRMP) and/or having little motorized recreation. Some impact on cultural values would occur, however, regardless of which alternative is selected for implementation. This would be an unavoidable adverse impact. Mitigative measures specified in Bureau Manual 8100 and applied equally to any alternative selected would minimize impacts.

The mitigating measure that stipulates avoidance of sites would usually provide the most protection to cultural values. Mitigating measures specific to roads include changing locations of proposed roads or project boundaries, or designating a buffer zone, to exclude the cultural resource from the impacted area.

Mitigating measures for cultural resources specific to logging activities (including directional falling and full suspension yarding) would protect the cultural site from all, or most, adverse effect. In the case of tractor yarding, cultural site protection may involve a combination of directional falling and pre-planned skid trails.

Where other measures cannot be used, the proposed mitigation may be data recovery excavation. Excavation would have minimal impacts when conducted according to a data recovery plan prepared and implemented by professional archaeologists, and with the consultation of the State Historic Preservation Office and review by the Advisory Council on Historic Preservation. Excavation would support archaeology studies and have the potential of increasing the cultural knowledge of a certain area.

Effects on Visual Resources

Visual resource management takes into consideration scenic quality on a landscape basis. To a large degree, effects on the scenic quality are subject to the varying perspectives of our diverse population. Changes in the landscape may be considered adverse by some people, but be acceptable to other people.

Timber harvesting, road construction, mineral development, and most other timber management practices cause visual impacts by changing vegetative patterns, altering species composition, and disrupting the land surface. The level of visual impact depends on many factors, including type of harvest; location, number, size, and shape of cutting units; yarding method; location and design of roads; amount and treatment of logging and road construction debris; visibility of disturbed areas; and differences in viewers' perceptions and values. Likewise, the severity of impacts from mineral development and road or right-of-way construction would vary depending upon the areal extent of such developments, mining techniques, and right-of-way type.

The pre-disturbance condition of a viewshed is another important factor in assessing impacts to visual quality. Generally, viewsheds that are noticeably altered can be further modified with less adverse visual impact than viewsheds with little or no visible alteration. Considering pre-disturbance condition in some situations, visual impacts from timber management practices can be beneficial. Examples include removal of dying or dead trees, thinning of foreground vegetation to create pleasing views, and manipulation of contrasting cutting boundaries, especially on ridgetops.

Another factor that influences scenic quality is the land ownership patterns. Where BLM-administered lands dominate the landscape, BLM management activities would affect the overall scenic quality of the area. Where non-BLM-administered lands dominate the landscape, activities and management practices on those lands could have a greater potential for affecting overall scenic quality. In the latter instance, BLM management actions would have minimal influence on overall scenic quality of an area over the long term and, in some cases, the short term.

In all alternatives except D, the VRM classes and management objectives differ from the VRM inventory classifications shown in Map 3-7. The reason for these differences is that the VRM classes and objectives for each alternative are designed to fit the overall resource management emphasis of the alternative. An alternative that assigns a higher management class than the one assigned through the VRM inventory would provide more restrictive visual resource management (i.e., less vegetative disturbance) for affected areas. Assigning a lower management class would have the opposite effect and, consequently, could result in higher levels of vegetative disturbance and lower scenic quality in affected areas.

Table 4-24 summarizes probable changes in visual resource conditions in the short term due to assigned VRM management classes and actions under each alternative.

Under all alternatives, no adverse changes in visual resource conditions would occur on approximately 600 acres of BLM-administered land encompassed by Squaw Island Wilderness Area, the Zwagg Island and North Sisters Rocks Wilderness Study Areas, and the Cherry Creek Instant Study Area. These areas would continue to be managed to meet VRM Class I standards in accordance with requirements for congressionally designated wilderness and BLM's "Interim Management Policy for Wilderness Study Areas." On the remaining BLM-administered lands, changes in visual resource conditions would vary by alternative based on differences in the acreage assigned to each VRM management class and their varying management prescriptions, especially relative to timber management.

Under the No Action Alternative, general visual resource conditions on BLM-administered land would continue to decline moderately on a short-term basis due to VRM Class IV management of lands inventoried as VRM classes II and III, and continuation of the timber harvest levels and prescriptions established in 1983 for the previous land use plan (MFP).

Alternative A would result in the most adverse change to visual resources. Under this alternative, 10,600 acres of VRM Inventory Class II and 54,200 acres of Inventory Class III would be assigned to VRM Management Class IV, the least restrictive of the VRM Management classes. Harvest of approximately 6,800 acres of these lands in the 10-year period would result in a short-term loss of visual quality since VRM Class IV management does not provide for special visual resource protection or mitigation measures. The intensity and duration of

Table 4-24. Visual Resource Management Direction by Alternative

Current VRM Inventory		Alternative													
		PRMP		NA		A		B		C		D		E	
Class	Acres	Acres[1]	Harvest[2]	Acres	Harvest	Acres	Harvest	Acres	Harvest	Acres	Harvest	Acres	Harvest	Acres	Harvest
I	600	600	0	600	0	600	0	600	0	6,700	0	600	0	600	0
II	14,600	6,600	40	4,300	280	4,000	2,160	6,500	1,750	8,700	940	14,600	480	53,000	3,440
III	62,800	14,700	260	1,000	100	8,600	4,640	16,500	4,450	34,800	3,760	62,800	2,100	269,900	9,160
IV	251,600	307,700	5,480	323,700	36,920	316,400	44,700	306,000	43,800	285,500	8,800	251,600	8,920	0	0

[1] Acres assigned to VRM management class by alternative. These may differ from acres assigned to classes in the VRM inventory.

[2] Number of acres projected to be harvested during the expected 10-year life of the plan within the VRM inventory classes.

this impact would depend partly upon the visual quality of surrounding lands.

Under Alternative B, VRM Class IV management would be applied to 54,400 acres presently inventoried as VRM Classes II and III. Timber harvest on approximately 6,200 acres of Inventory Class II and III lands in the 10-year period would result in a short-term loss of visual quality due to the vegetative disturbance associated with clearcut timber harvests. Harvest on approximately 430 acres within VRM Class II-managed lands during the decade is expected to have insignificant impact since this acreage represents only about 6.5 percent of the total VRM Class II lands managed under this alternative. Also, special design features identified on a site-specific basis through the timber sale planning process and applied to harvest activities on Class II lands would mitigate or minimize potential adverse impacts to visual quality on these lands.

Under Alternative C, VRM Class IV management would be applied to 33,900 acres inventoried as VRM Classes II and III. Harvest on approximately 4,700 acres of Inventory Class II and III lands harvested in the 10-year period would result in a short-term loss of visual quality due to the vegetative disturbance associated with clearcut timber harvest. Another 500 acres of timber harvest within VRM Class II-managed lands during the decade is expected to have insignificant visual impact because this acreage represents only about six percent of the total VRM Class II management lands under this alternative. Also, special design features identified on a site-specific basis through the timber sale planning process and applied to harvest activities on VRM Class II lands would mitigate or minimize adverse impact to visual quality.

Under Alternative D, which calls for managing all lands in accordance with guidelines for their assigned VRM class under the visual quality inventory, existing scenic quality conditions on all BLM-administered lands would be maintained. The harvest of 480 acres on VRM Class II-managed lands during the decade is expected to have minimal visual impacts due to special design features identified and applied on a site-specific basis through the timber sale planning process.

Alternative E would have the least impact on visual resources of any of the alternatives since all BLM-administered lands would be managed in accordance with guidelines for their assigned VRM class under the visual quality inventory or for a higher class. All high value scenic and sensitive viewing areas would be assigned to VRM Class I for protection from noticeable disturbance. This alternative would also have the least short-term adverse visual impact from timber harvests since it proposes the lowest levels of timber harvest overall. The visual quality of areas with presently low-to-moderate scenic value or low visual sensitivity would improve in the long term since all VRM Inventory Class IV areas would be managed in accordance with the more rigorous VRM Class III guidelines.

Under the PRMP, there would be unavoidable adverse visual impacts from a short-term loss of scenic quality due to anticipated timber harvests on approximately 40 acres of VRM Class II and 260 acres of Class III lands. These losses would, however, be reversed in the long term through normal reforestation practices.

Effects on Wild and Scenic Rivers

Apart from the No Action (NA) Alternative, interim management would be implemented on BLM-administered land to fully protect river-related values of the four river segments determined to be eligible for inclusion as components of the National Wild and Scenic Rivers System (NWSRS), but which are not being studied for suitability in the RMP (Umpqua, South Fork Coos, South Fork Coquille, and Sixes River). This interim protection would continue pending resolution of the wild and scenic river issue involving these eligible river segments. The following environmental consequences discussion relates solely to the seven BLM-administered river segments studied for suitability in the RMP (Wassen Creek; and Smith, North Fork Coquille, East Fork Coquille, New, South Fork Pistol, and North Fork Chetco rivers).

To be eligible for inclusion as a component of the NWSRS, a river or river segment must be in a free-flowing condition and possess at least one river-related value determined to be outstandingly remarkable. These two Congressionally-established criteria are used to judge changes in resource conditions, particularly adverse changes. If resource management activities inherent to a specific alternative altered flow characteristics of a study river segment, or degraded the segment's river-related outstandingly remarkable values (hereinafter referred to as ORVs), the change created by the actions allowed under that alternative would be adverse.

Addressing first the impacts of BLM resource management activities on flow characteristics, none of the alternatives include management activities that would adversely affect the free-flowing condition of the seven study river segments. However, under alternatives where a river or river segment is found to be unsuitable for inclusion as a component of the NWSRS, an externally proposed project such as a dam may be determined to be consistent with the RMP. Under this circumstance, a proposed project could be approved and ultimately constructed, thereby interrupting the segment's free-flowing condition.

The impacts on river-related values from BLM resource management activities would vary by alternative. Table 4-25 shows probable short-term changes in the ORV conditions of each of the seven study river segments by alternative. The rationale supporting these determinations of condition change was presented in the separate suitability assessment for each study river segment (Appendix II-N of the draft RMP). Suitability determinations for each alternative and for each study river segment are displayed in Chapter 2 (Table 2-1).

As shown in Table 4-25, short-term changes to the fish-related ORV would be negligible or nonexistent for six study river segments, regardless of alternative (see Fish section for rationale). This ORV is not discussed further. The short-term impacts of probable changes in other ORVs within each river's 0.5-mile wide study corridor (0.25-mile from the ordinary high water mark on each side of a river segment) are summarized below.

Under the NA, 10 of 11 the river segments determined to be eligible for inclusion as components of the NWSRS would not receive special interim management to specifically protect identified river-related values since wild and scenic rivers eligibility/ suitability was not an MFP-related issue. New River would have most values protected through designation as an ACEC.

Outside the protective land allocations prescribed under the NA, most BLM-administered lands within the seven study river corridors would continue to be managed by way of multiple-use prescription, including timber management. During the 10-year period, it is probable that some prescribed management activities, primarily timber harvest and road construction, would adversely affect the ORVs for which the study river segments were determined eligible. Under the NA, the eligibility status of Wassen Creek would not be maintained. The estimated number of harvest units and miles of road construction along Wassen Creek would reduce identified ORVs to less than an outstandingly remarkable condition following harvest or project development. Grazing, water diversion, and streambank modifications could conceivably reduce the ORVs of New River to less than an outstandingly remarkable condition, and its classification would drop from scenic to recreational. The eligibility status of the other five study river segments would be maintained over the 10-year period.

Outside the riparian management areas (RMAs) prescribed under Alternative A, most BLM-administered lands within the seven study river corridors would continue to be managed by way of multiple-use prescription, including timber management (except on New River). During the 10-year period it is probable that some prescribed management activities, primarily the estimated 142

Table 4-25. Probable Short-Term Changes in Outstandingly Remarkable Value Conditions for Study River Segments Under Each Alternative

Study River Name	Highest Potential Classification	Outstandingly Remarkable Value	Probable Changes by Alternative [1]						
			PRMP	NA	A	B	C	D	E
Smith River	Recreational	Fish & Wildlife	0	0	0	0	0	0	0
Wassen Creek	Recreational	Fish & Wildlife	0	-	-	-	0	0	+
		Ecologic	0	-	-	-	0	0	+
North Fork Coquille River	Recreational	Fish & Wildlife	0	0	0	0	0	0	0
		Historic	0	0	0	0	0	0	0
East Fork Coquille River	Recreational	Fish & Wildlife	0	0	0	0	0	0	0
New River	Scenic	Scenic	0	0	0	0	+	+	+
		Fish & Wildlife	0	0	0	0	0	0	0
		Ecologic	0	0	0	0	+	+	+
		Geologic	0	0	0	0	0	0	0
South Fork Pistol River	Recreational	Fish & Wildlife	0	0	0	0	0	0	0
North Fork Chetco River	Recreational	Fish & Wildlife	0	0	0	0	0	0	0
		Historic	0	0	0	0	0	0	0

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[1] Abbreviations used in this table:
0 = No change or negligible
- = Adverse
+ = Beneficial

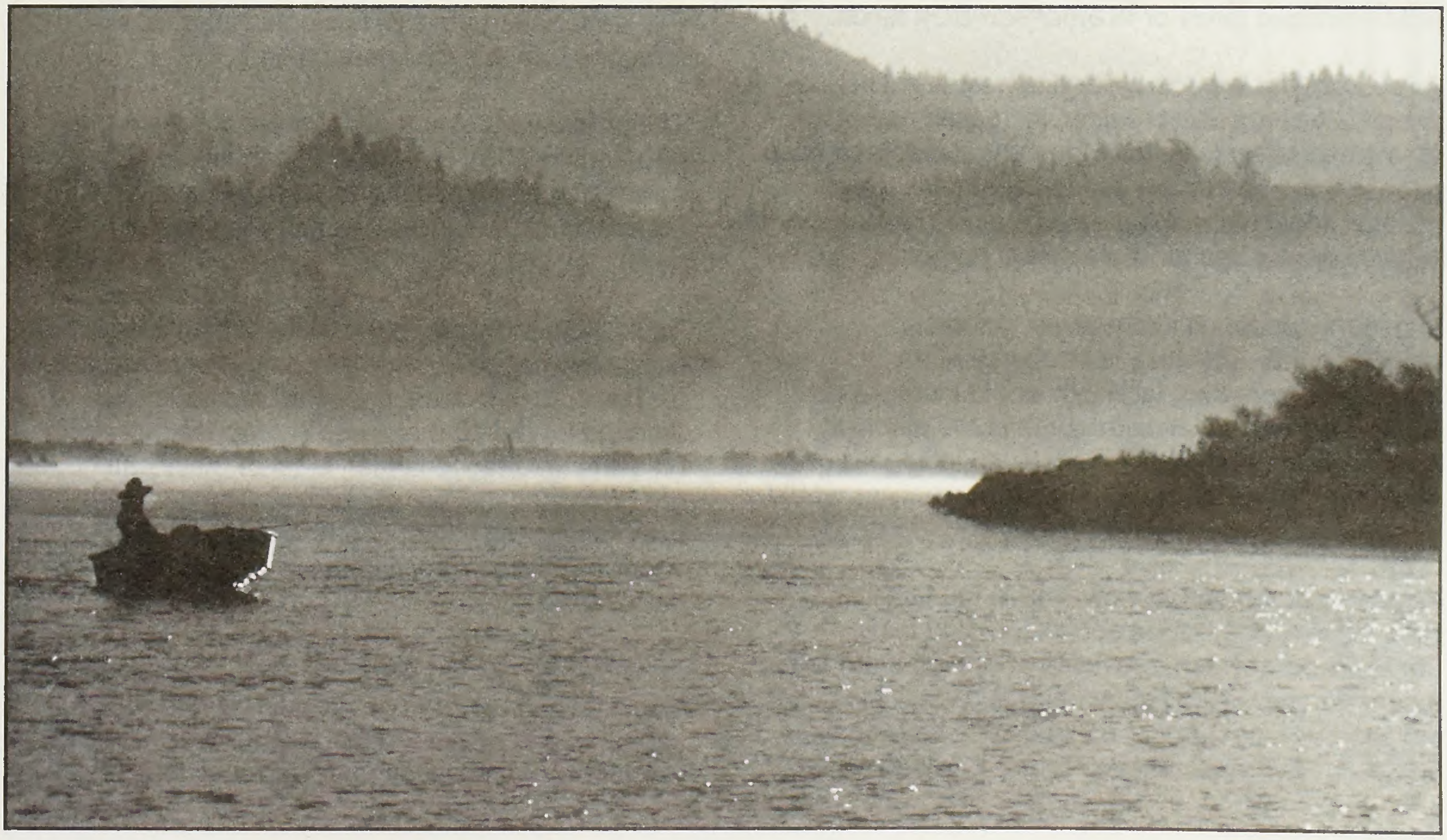
timber harvest units totaling just over 2,300 acres, and an estimated 8.9 miles of new road construction, would adversely affect the ORVs for which the study river segments were determined eligible. Under this alternative, the impacts of management activities on the eligibility status and potential classification of the seven study rivers would be similar to those described for the NA.

Outside the RMAs prescribed under Alternative B, most BLM-administered lands within the seven study river corridors would continue to be managed by way of multiple-use prescription, including timber management. During the 10-year period it is probable that some prescribed management activities, primarily the estimated 127 timber harvest units totaling 1,900 acres, and an estimated 8.5 miles of new road construction, would adversely affect the ORVs for which Wassen Creek was determined eligible. Some activities on private lands, including grazing, water diversion, and streambank modification, could adversely affect the ORVs for which New River was determined eligible. Under this alternative, the impacts of management activities on the eligibility status and potential classification of the seven study rivers would be similar to those described for the NA.

Under Alternatives C, D, and E, short-term management activities would not affect the eligibility status and highest potential classification of any study river segment.

In the Proposed Resource Management Plan (PRMP), none of the rivers on the district would be found suitable for designation to the wild and scenic river system. While this would have the potential to negatively impact the ORVs of Wassen Creek and New River, the ORVs of both would largely be protected by ACEC management plans.

Public-managed portions of New River would be protected through implementation of the ACEC Management Plan and administration of the state of Oregon recreation easement. Private-managed portions of New River could be reduced to less than an outstandingly remarkable condition through overgrazing, water diversion, and streambank modifications. Changes in ORV condition from these actions could cause this study river segment to be ineligible for inclusion in the national system, or to be reduced from scenic to recreational eligibility.



Effects On Recreation

The impact on recreation from management actions proposed under the various alternatives can be characterized in terms of their effect on the ability of BLM-administered lands to meet current and projected demand for specific recreational activities. Timber harvests, road and bridge construction, mineral development, designation and management of special areas and recreation sites, and numerous other resource uses and management practices can affect recreation by influencing the type, distribution, availability, extent, and quality of public recreation opportunities on BLM-administered lands. These factors directly affect the level and patterns of recreational use that occur and consequently the demand for various recreational uses that are accommodated on BLM-administered lands.

Some management actions may have both beneficial and adverse effects on recreation. For example, actions that improve or increase opportunities for visitors seeking one form of recreation may diminish opportunities for visitors seeking other forms because resource requirements and expectations vary greatly from one user group to the next and can sometimes be in conflict. In other instances, management actions that increase use of a site or an area may displace current users who prefer less crowded settings or fewer contacts with other users. Depending upon the particular recreational activity and the availability of other suitable opportunities, these displaced users may shift their use to other BLM-managed lands or to other non-BLM lands.

Aside from the impacts related to people's differing perspectives about recreation, increased use of an area could adversely affect the natural resource base upon which a recreation use is dependent. Such impacts could make the area less attractive or less suitable to manage for recreational purposes.

In general, under all alternatives, dispersed recreation (i.e., activities not dependent on developed recreation facilities) would increase on BLM-administered lands throughout the planning area as visitor demands for such use increases. Any differences in levels of use among alternatives would be minor.

Of particular relevance, however, is the fact that BLM-administered lands and waters and the transportation system providing access to them are extensive and would not be used to capacity in either the short or long term for many dispersed recreation activities. Even Alternatives D and E, which would limit motorized vehicle use to major roads in many areas, would continue to provide adequate opportunities for public participation in many of the dispersed recreation activities with no appreciable deterioration in experience quality.

Unlike dispersed recreation, the projected demand for facility-dependent recreation would exceed developed site opportunities on BLM-administered lands under four alternatives in the short term. Specifically, Alternatives NA, A, B, and C would not meet the demands for developed site camping and boating. Similarly, the demands for non-motorized travel on developed trails and for other land-based recreational uses would not be met under Alternatives NA, A, and B. Alternatives D, E, and the Proposed Resource Management Plan (PRMP) would provide adequate developed site opportunities for facility-dependent recreation uses.

In the short term, timber harvest would not adversely affect either dispersed or existing developed recreation site opportunities under any of the alternatives. Some adverse effects on facility-dependent recreation opportunities could occur, however, under Alternatives NA, A, and B where lands that have potential for recreation facility development would be allocated to timber management. Specifically, under Alternatives NA and A, recreational resource values involving five potential trails, one potential boat ramp, and one potential campground site could be foregone in the short and long term due to projected timber harvests that overlap these sites (see Table 2-7 in Appendix E). Under Alternative B, two potential trails would be foregone due to such overlapping.

The proposed timber management actions under Alternatives C, D, E and the PRMP would not adversely impact either dispersed or developed recreation opportunities in either the short or long term.

Table 4-26 shows, by alternative, the anticipated short-term capability of BLM-administered facilities and resources to meet projected recreational demand for the 10 major use categories that occur on district-managed lands. Most of these categories are discussed individually below. The demands for both fishing and winter sports are expected to be met under all alternatives, and therefore are not discussed further.

As shown, projected demand for all recreation uses would be met under the PRMP. This conclusion appears valid even though the SEIS indicates that the supply of landscape settings with little

Table 4-26. Anticipated Short-Term Capability of BLM-Administered Facilities and Resources to Meet Projected Recreational Demand for 10 Major Use Categories by Alternative

Recreation Use Category[1]	Projected Demand (in Visits for Year 2000)[2]	Anticipated Capability to Meet Demand						
		PRMP	NA	A	B	C	D	E
Off-highway travel (e.g., driving motorcycle, ATVs and 4X4 vehicles off the road)	107,000	yes	yes	yes	yes	yes	no	no
Motorized travel (e.g., sightseeing and exploring)	349,800	yes	yes	yes	yes	yes	yes	yes
Nonmotorized travel (e.g., bicycling, day hiking/backpacking and horseback riding)	276,800	yes	no	no	no	yes	yes	yes
Camping	177,200	yes	no	no	no	no	yes	yes
Hunting	57,100	yes	yes	yes	yes	yes	yes	no
Other land-based use (e.g., picnicking, studying nature and viewing wildlife)	336,100	yes	no	no	no	yes	yes	yes
Fishing	193,600	yes	yes	yes	yes	yes	yes	yes
Boating	75,000	yes	no	no	no	no	yes	yes
Other water-based use (e.g., swimming, windsurfing, general waterplay, tubing)	57,600	yes	yes	no	no	yes	yes	yes
Winter sports (e.g., cross-country skiing, snowshoeing and sledding/snowplay)	9,200	yes	yes	yes	yes	yes	yes	yes
TOTAL	1,639,400							

[1] Source: USDI, Bureau of Land Management, Recreation Management Information System.

[2] Extrapolated from: Hospodarsky, Denver. 1989. The Pacific Northwest Outdoor Recreation Consumption Projection Study; Oregon Project, Final Report. Oregon State University. Projections assume no growth in 1987 supply of recreation sites and facilities. Demand for recreation opportunities at New River and Dean Creek not included since those sites did not exist in 1987 when actual use was measured. Does not include demand by out-of-state visitors.

development, little management activity, and no motorized access (primitive and semi-primitive non-motorized recreation opportunity settings) would not meet anticipated demand over the short term. This FEIS assessment considered recreation needs in terms of total acres within specific settings. Table 4-26 on the other hand, considers recreation demand in terms of total visitation by specific activity groupings. These separate evaluations cannot be compared for consistency since the conclusions reached are based on very different sets of data.

Motorized and Off-Highway (Road) Vehicle Travel

All alternatives are expected to meet the planning area's demand for motorized travel (e.g., sightseeing and exploring); however, existing patterns of motorized travel use may be altered under Alternatives C, D, E, and the PRMP due to road closures and designation of five Back Country Byways. The road closures would concentrate travel on the open roads, and the designation of Back Country Byways may increase travel interest on those designated routes.

Closure of 525 miles of existing road under Alternative C is not expected to significantly impact motorized travel needs; the remaining 1,040 miles of logging roads would adequately meet the demands for motorized sightseeing and exploring on both paved and gravel roads. Similarly, the 785 miles of open roads in Alternative D, the 525 miles of open roads in Alternative E, and approximately 775 miles of open roads in the PRMP would meet the motorized travel demands.

Demand for off-road travel would be met under all alternatives except D, E, and the PRMP. An anticipated 25 percent increase in demand for off-highway vehicle travel by the year 2000, coupled with the miles of roads proposed for closure in these three alternatives, would result in a shortage of opportunities for 4-wheel drive, off-road motorcycle, and other off-highway vehicle use. The closure of 775 miles of roads except for administrative or special use purposes under the PRMP, and 780 miles under Alternative D, would close approximately half of the district's existing roads to general public vehicular access. With these road closures, the PRMP and Alternative D would meet only 60 to 80 percent of the OHV demand. Alternative E, which proposes closure of 1,040 miles of roads, would meet only 50 to 60 percent of the demand.

Non-motorized Travel

The projected demand for the non-motorized travel category would be met by Alternatives C, D, E, and the PRMP, which have the potential for between 40 and 65 miles of trail development. Additional trails could be identified and developed within special areas or SRMAs as activity plans are prepared. Alternatives NA, A, and B—which have little or no trail construction proposed—would not meet the demands for non-motorized travel.

Analysis of the recreational uses within the non-motorized travel category indicates that developed opportunities for day-hiking would fall shortest of demand. This assessment was based upon the following assumptions:

- Additional supply typically generates increased demand.
- Day-hiking already comprises approximately 60 percent of the current demand for non-motorized travel uses in the planning area.
- Current demand for day-hiking already far exceeds supply.
- The demand for hiking opportunities alone is expected to increase by about 85 percent, or an additional 53,000 visits annually by the year 2000 (see Chapter 3, Table 3-44).

Under the NA, where only 0.5 mile of developed trails would be provided, non-motorized travel use related to developed trail systems would not be met. While most of the demand for day-hiking would not be met, existing roads would accommodate some of the increased demand for horseback riding and mountain biking. Overall, the NA would accommodate only 20 to 50 percent of the demand for non-motorized travel uses of BLM-administered lands.

Alternative A, providing only 0.25 mile of trails, would also result in a shortage of opportunities for day-hiking. Substantially less than 50 percent of the total demand for developed trail-based day-hiking would be met under this alternative.

Under Alternative B, the proposed 11 miles of new trails for hiking and other non-motorized travel would only accommodate about 70 percent of the demand for non-motorized travel opportunities. Day-hiking is expected to have the largest share of this shortfall.

Specific management actions under Alternatives C, D, E, and the PRMP would provide adequate facilities to support the projected demand for non-motorized travel on BLM-administered lands in both the short and long term. In Alternative C, designation of seven new trails could result in an estimated 40 miles of new trails for hiking and other non-motorized travel uses. Additionally, the 525 miles of roads that would be closed under this alternative could provide a substantial network of additional opportunities for horseback riding and mountain biking on BLM-managed lands.

New trails, the expansion of Loon Lake Recreation Site, and road closures under Alternatives D, E, and the PRMP would similarly support the projected demand for non-motorized travel uses. Alternatives D and E would provide the most opportunities with approximately 60 miles of new trails, and 780 and 1,040 miles of road closures respectively. The PRMP would provide approximately 42 to 56 miles of new trails and approximately 775 miles of road closures (see Table 2-5 in Chapter 2).

Camping

While the district's extensive land base would easily satisfy the demand for dispersed or undeveloped area camping use under any alternative, the demand for developed campsites already exceeds the supply at some sites. Loon Lake is most notable among these, but the demand for camping at Sixes River, Bear Creek, Park Creek, and Smith River Falls recreation sites also exceeds supply at peak use periods such as national holidays and many summer weekends. Moreover, the demand for camping is expected to increase by more than 32 percent by the year 2000. Foregoing opportunities to expand or develop campgrounds under Alternatives NA, A, B, and C would not meet the projected demand for developed-site camping.

Under the NA, where no additional recreation sites would be developed and no expansion would be done on existing sites, the projected growth in demand for developed site camping would be almost entirely unmet.

Under Alternative A, only 50 to 70 percent of the projected demand for facility-dependent camping would be accommodated due in part to the closure of four existing developed sites and removal of their facilities. Another contributing factor to the shortage of recreation facilities under this alternative would be that one potential site (Big Bend), currently allocated to recreational development, would not be retained for future development. Considering the expected growth in demand, the closure of these sites (which comprise 20 percent of the current developed camping opportunities) would cause a significant shortage of developed site opportunities for camping on BLM-administered lands in the planning area.

Under Alternative B, where facility-dependent camping opportunities could increase by 25 percent by the end of the decade, the projected demand would still exceed supply; only 60 to 80 percent of the overall demand for camping on BLM-administered land would be met.

In Alternative C, due to designation and development of three new overnight use recreation sites and the Coos Bay Shorelands SRMA, facility-dependent camping opportunities could increase by 35 percent. This increase would not be sufficient, however, to fully accommodate the demand for developed camping opportunities. Between 80 and 90 percent of the overall demand for camping on BLM-administered lands would be met under Alternative C.

The projected demand for both dispersed and developed site camping would be fully accommodated under Alternatives D, E, and the PRMP. Specifically, under Alternatives D and E, facility-dependent camping opportunities could increase by about 50 percent by the end of the decade with the designation and development of six new overnight-use recreation sites, the Coos Bay Shorelands SRMA, and expansion of the Loon Lake recreation site. Under the PRMP, facility-dependent camping opportunities could increase by approximately 40 percent by the end of the decade with designation and development of four new recreation sites, the Coos Bay Shorelands SRMA, and expansion of the Loon Lake recreation site.

Hunting

In general, the district's extensive land base and road network would be more than adequate to meet both current and projected demands for hunting under all alternatives except Alternative E, which would meet between 70 and 90 percent of demand. Designating only 525 miles of road as open to motorized access under Alternative E could result in overcrowded conditions for drive-in hunting on lands serviced by these roads. (For purposes of this analysis, the term "drive-in" is used to describe hunting in roaded areas that involves driving to clearcuts, young forest stands, and other openings to hunt primarily in these sites.) While some drive-in hunters prefer walk-in opportunities and would shift their use to areas with closed roads, overcrowded conditions would cause some drive-in hunters to shift their use to non-BLM-administered lands, assuming such lands are open to hunting.

In the analysis of hunting activity, it was assumed that 70 percent of big game hunters in the planning area prefer walk-in (i.e., primitive or semi-primitive settings) hunting opportunities in which only occasional contacts with other hunters occur. This assumption was based on a recreational needs assessment by Oregon State Parks and Recreation Department (OSPRD) in 1991. Considering this needs assessment, walk-in hunting opportunities may not be fully met in Alternatives NA, A, B, and the PRMP. Available anecdotal information, however, disagrees with the OSPRD study, which makes the assumption and the conclusion about the alternatives subject to some debate.

Under the NA, a significant shortage of walk-in hunting opportunities would occur due to the limited number of road closures on BLM-managed lands. Only 11 percent (170 miles) of existing roads would be closed to motorized vehicle access, and the majority on a voluntary compliance basis only.

Alternatives A and B, with all existing roads open to motorized vehicle access, would have the largest shortage of walk-in hunting opportunities.

The current and projected demands for both drive-in and walk-in hunting opportunities should be met under both Alternatives C and D. Alternative C, by providing 1,040 miles of open roads and closing 525 miles, would satisfy both types of hunters. The PRMP and Alternative D, which would designate about half of all roads as closed to motorized access, should provide sufficient walk-in opportunities. The PRMP and Alternative D should also meet the demand for drive-in hunting use without overcrowding when considering that many drive-in hunters might shift their use to walk-in areas.

Other Land-Based Use

In general, over both the short and long term, the planning area's extensive land base is more than adequate to satisfy the demand for dispersed picnicking, nature study, and wildlife viewing in undeveloped settings. Developed site opportunities for picnicking which is expected to grow by 26 percent by the year 2000, however, would fall short of meeting projected demand under Alternatives NA, A, and B.

Under the NA, which does not provide for development of any new day-use recreation sites, approximately 85 percent of the projected demand for picnicking would be met. Under Alternative A, which proposes closure of four sites (20 percent of existing developed opportunities) and removal of their facilities, approximately 75 percent of the facility-dependent picnicking demand would be accommodated. Alternative B would satisfy 90 percent of the demand for picnicking, since the number of developed picnic sites on BLM-administered lands could increase by about 25 percent by the end of the decade under this alternative.

Designation and development of new recreation sites and expansion of Loon Lake Recreation Site under Alternatives C, D, E, and the PRMP would meet the demands for developed site opportunities for picnicking in the long term. By the end of the decade, the number of developed picnic sites could increase by 50 percent in Alternative C, 100 percent in Alternatives D and E, and 80 percent under the PRMP.

Boating

The demand for developed boating access is expected to increase by 25 percent (more than 15,000 visits annually) by the year 2000. Four of the alternatives (NA, A, B, and C) would not fully meet this demand.

Under the NA, which does not include planning for any new boat ramps, only about 50 percent of the expected increase in demand for boating use (7,500 visits) would be met. Some of the increased demand would be serviced by the undeveloped boating access currently used by boaters.

Alternative A would accommodate most of the projected demand for boating access with the development of the North Spit boat ramp and a substantial amount of undeveloped boating access, but would still meet only 50 to 60 percent of the demand for developed boating access on rivers and streams.

Under Alternative B, development of the boat ramp on the North Spit and two boat launch sites on the Sixes River in addition to undeveloped boating access would accommodate most of the projected boating demand. This alternative would, however, meet only 60 to 70 percent of the demand for developed boating access in rivers and streams.

Under Alternative C, development of the North Spit boat ramp, two boat launch sites on the Sixes River, and another on Smith River would accommodate part of the projected demand for boating. Undeveloped boating access would also accommodate a portion of the demand. An estimated 70 to 80 percent of the overall demand for boating access would be met with this alternative, which is a slightly higher level than for Alternatives A and B.

For Alternatives D, E, and the PRMP, development of the North Spit boat ramp and other boat launch sites on various rivers (11 rivers in Alternative D and E; and 7 rivers in the PRMP) would be adequate to meet the projected demand for boating opportunities.

Effects on Timber Resources

Introduction

Timber is an important component of the resources managed by BLM in western Oregon. Each of the seven alternatives described in Chapter 2 would affect BLM's timber resource and its availability for harvest in a different way. Each alternative would directly affect the age, size, type, distribution, and productivity of the district's timber stands and the way they change over time. The alternatives could result in different levels of forest health and responses to disturbances such as fire, wind, insects, or disease, which in turn could affect the long-term timber production of the forest. This chapter describes the effects of the alternatives on the timber resource.

The most measurable effects between alternatives are:

- Acres of land available for timber production.
- Probable sale quantity (PSQ).
- Acres harvested per decade.
- Acres of forest land converted to roads.
- Age class distribution in the future forest.

Acres of Land Available for Timber Production

The suitability of land for timber production is determined through the TPCC inventory which is described in the Timber Resources section of Chapter 3. Sites considered suitable for timber production include two categories: Suitable Commercial Forest Land (SCFL) and Suitable Woodland (SWL).

SCFL sites are judged to be suitable to manage for a sustained yield of commercial conifer species and are included in the land base used for PSQ calculations under all alternatives, unless excluded for other reasons. Allocation of SCFL lands for protection or enhancement of nontimber resource values reduces the number of acres available for timber production which reduces the PSQ.

Some SWL sites may be capable of producing a sustained yield of forest products, but would generally require a longer regeneration period due to difficulty in achieving reforestation standards and/or a longer rotation because of the low site quality to produce a commercial product. Other SWL sites are capable of producing a sustained yield of commercially valuable hardwoods or noncommercial species. Under Alternatives A, B, and C, some categories of SWL sites are included in PSQ calculations.

Table 2-1 (Chapter 2) displays the acres available for intensive management, constrained management, and management for enhancement of other uses for each alternative. Table 4-27 displays the land use allocations in a hierarchial order (i.e., acreage does not overlap) for each alternative.

One general method for assessing impacts to the PSQ when the TRIM-PLUS model is not used is to identify the number of acres not allocated to timber production. For every 1,000 acres of potential timber production land not allocated, there is a reduction in the annual PSQ of approximately one MMBF. Impacts to the PSQ are usually associated with the reduction of timber production acreage for the enhancement or protection of other resource values, such as water quality, special areas, recreation, or wildlife.

Anticipated mineral entry under all of the alternatives is not expected to have a significant impact on timber resources. For leasable mineral activities, less than 200 acres is expected to be impacted by any alternative. Less than 100 acres would be affected by locatable or salable mineral activities. Few, if any, acres allocated to timber production would be disturbed in mineral exploration or development. Should an action such as coal leasing require strip mining and loss of timber production acres, a separate analysis would be required. For the next decade, mineral impacts are anticipated to be similar to those of the last decade, which have been negligible.

Recreation opportunities under the various alternatives would have a minor impact on lands allocated for timber production as most of the existing or proposed recreation sites are located in areas where timber production is either prohibited or restricted for other reasons. It is possible, however, that some recreation sites could be expanded through land exchanges, which could result in a net loss of timber production land and a reduction in the PSQ. The potential recreation land that could reasonably be acquired under any alternative

Table 4-27. District Acreage Summary by Alternative

	PRMP	NA	A	B	C	D	E
Enhancement of Other Uses or Unavailable							
Congressional Reserves	600	600	600	600	600	600	600
Late-Successional Reserves	136,800						
District Defined Reserves [1]	38,300						
Riparian Reserves or Riparian Management Areas	89,600	10,800	11,100	11,200	15,900	31,300	45,700
Diversity Blocks		24,700					
Seral Stage Blocks				18,600			
R&R blocks					38,100		
Habitat Conservation Areas						75,500	
150 year + with buffer							76,300
40-acre blocks							2,900
Special Areas/Recreation		800	2,300	2,800	5,100	4,700	4,700
Nonforest Lands		17,900	17,900	17,900	17,900	17,900	17,900
TPCC		2,800	0	2,700	4,900	4,900	16,500
Nonsuitable Woodlands		21,100	29,800	30,200	31,400	31,400	31,400
T&E species		100	100	400	400	400	22,100

Table 4-27. District Acreage Summary by Alternative (continued)

	PRMP	NA	A	B	C	D	E
Intensive Management							
General Forest Management Area or Intensive Management	54,900	243,300	265,000	241,800	0	0	83,100
Constrained or Restricted Management							
Connectivity/Diversity Blocks	6,600						
VRM II	400	4,300	0	500	0	4,600	18,900
Low Retention Areas					124,600		
High Retention areas					87,900		
50-11-40						153,400	
Rural Residential Areas	0	0	0	100	0	2,100	6,700
Total District Lands	327,200[2]	326,400[3]	326,800[4]	326,800[4]	326,800[4]	326,800[4]	326,800[4]

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[1] District Defined Reserves include areas designated for Special Management Areas, Existing or potential Recreation Areas/Sites, Nonforest lands, TPCC unavailable lands, and Threatened and Endangered species habitat.

[2] Acreage derived from Micro*Storms reflects acquisitions between the draft RMP and the PRMP.

[3] Acreage derived from the ROD South Coast-Curry Management Framework Plan.

[4] Acreage derived from Micro*Storms.

involves less than 1,000 acres, not all of which would involve a land exchange. Some land acquisition could be accomplished through purchase or donations. Considering these various factors, the impacts on the timber resource would be negligible.

Designation of five Back Country Byways would not impact the PSQ as timber management activities along the byways would be similar to adjacent timber management lands.

Designation of proposed ACECs and RNAs under Alternatives B, C, D, and E could remove up to 4,600 acres of commercial forest land (CFL) from timber production which would reduce the annual PSQ by four to five MMBF. Impacts under Alternative A would be minimal as less than 500 acres of CFL would be withdrawn from timber production. Under the PRMP, about 1,300 acres of CFL would be unavailable for timber production due to designation of special areas; however, based upon the premise that some acres may become available for limited harvesting after development of site-specific ACEC management plans, a one MMBF reduction in the annual PSQ is projected.

PSQ Levels

Alternative 9 of the SEIS estimated the Coos Bay District PSQ to be 43 MMBF long log scale. Although the proposed action in the PRMP and Alternative 9 in the SEIS are almost identical, the acreage of intermittent and first and second order streams included in the SEIS was not fully accounted for. When the PSQ for the PRMP was computed, the additional acreage of Riparian Reserves was included. The PSQ as displayed in the PRMP (32.1 MMBF) is based on short log scale. (Short log scale is approximately 18 to 20 percent greater than long log scale.) The combination of additional Riparian Reserves and difference in log scales used resulted in a 38 percent reduction in the district's PRMP PSQ when compared to the SEIS PSQ.

The PSQ level for the life of the plan will depend on the number of acres allocated to the various levels or intensities of timber management, the sustained yield capacity of those acres, and the initial volume and age-class distribution of the timber stands. Based on these parameters, the non-declining yield may be constrained by any of the following:

- Allocations established for the benefit of other resources.
- Economic feasibility of management on specific tracts.
- Limitations on intensity of timber management.
- Minimum harvest size or age standards.

The level of PSQ would be highest under Alternative A and lowest under the PRMP, with the PSQ for the other alternatives arrayed between them. The PSQ is defined as an estimate of annual timber sale volume likely to be achieved from lands allocated to sustainable harvest.

The probable non-declining even flow of timber (PSQ) could increase over time as progress is made towards a balanced age-class distribution of timber (i.e., a regulated forest) on lands available for timber management. When a regulated forest is achieved, the maximum non-declining even flow level would equal the long-term sustained yield (LTSY) capacity of the district's available forest lands under the selected management regime. Because of the silvicultural and forest management strategies used under Alternatives C and the PRMP, the classic concept of a regulated forest with a balanced age class distribution does not readily apply.

The non-declining even flow for each alternative was calculated for coniferous volume only. For the PRMP, an additional amount of hardwood volume will be available for the first decade, increasing the PSQ by approximately 14 percent. A large portion of this volume is derived from the conversion of hardwood stands to coniferous stands and will be dependent on funding of this intensive practice. After the first two decades, the hardwood component of the PRMP PSQ is expected to be relatively small.

The TRIM-PLUS computer harvest scheduling model was used to estimate the PSQ for all alternatives except NA and D, and for the sensitivity analyses of intensive management practices displayed below. For Alternative D, the "50-11-40 Model" was used. Estimates for the NA were derived from the ASQ developed in the current (1980s) planning cycle, which utilized the SIMIX Model. See Appendix U for a description of the TRIM-PLUS and other models used.

Empiric yield tables derived from the timber inventory provided the initial volume of existing stands. The Stand Projection System (SPS)—a computerized stand growth and yield simulator— generated yields for future managed stands based on plot data from southwestern Oregon.

For most of the basic land allocations and management prescriptions, the TRIM-PLUS model projected the age, size, and cubic foot volume of timber that could be harvested each decade for up to 20 decades. Table 4-28 lists the TRIM-PLUS-projected PSQ in both cubic feet and Scribner board feet for each alternative. While there is a sustained (non-declining) yield displayed in cubic feet for each alternative, equivalent board foot volumes decline for most alternatives as harvesting shifts to younger and smaller timber sizes. This shift of harvesting to younger and smaller trees is a result of depletion that would occur in the older stands and an increase in the amount of commercial thinning harvest.

Table 4-28 also shows a non-declining sustained yield in cubic feet the first 10 decades for all alternatives except D. All alternatives would show an increase in the sustained yield (cubic feet) in later decades as a more regulated forest is developed.

When compared to the first decade, Alternatives A and B show a PSQ decline in board foot volume through the 10th decade. Alternatives C, D, and E show a slight PSQ board foot decline into the second or third decade and then either a leveling off for Alternatives C and E, or a significant climb for Alternative D. The decline in board foot volume is a result of harvesting smaller logs, which have a smaller board foot/cubic foot ratio. The PRMP would have a slight PSQ reduction in board feet for the next 10 decades. Tables AA-1 through AA-7 in Appendix AA display acres harvested by age class for the first, second, third, fifth and tenth decade of the plan for each alternative. Although thinning and regeneration harvest acres fluctuate during the first three decades, the total acres harvested begin to decline between the tenth and twentieth decades as harvested stands begin to approach CMAI and respond to intensive management. Because stands harvested at CMAI will have more volume per acre, fewer acres will need to be harvested to obtain the PSQ volume.

If timber is harvested below CMAI as proposed in Alternatives NA, A, B, and E, a maximum non-declining PSQ could be obtained in the short term. Harvesting below the age of CMAI, however, would delay the time for the stand to reach regulation and LTSY capacity. CMAI represents the harvest age for an individual timber stand at its highest average annual level of wood production for the complete rotation.

In addition to the even flow quantity calculated for the PSQ under Alternative C, some timber harvest volume would be removed as partial cuttings from the blocks of land designated for restoration and retention (R&R) of mature and old-growth forest. These partial cuttings would be designed to accelerate development of old-growth structural characteristics in younger stands located within the R&R blocks.

The prescriptions for Alternatives C and the PRMP call for retention of a portion of the stand at harvest, development of stands with multiple canopy layers, maintenance of wider tree spacing through a series of density management cuttings, and management on longer rotations. These practices are intended to permit portions of the forest to develop old-growth structural characteristics at an accelerated rate. There is currently little available research that quantifies the expected timber yields from such stand management regimes for this area of western Oregon. Because modeling of the PSQ is more difficult for these two alternatives than for the other alternatives which rely on traditional forest management techniques, the level of confidence in their resulting PSQ is lower.

The PRMP would rely on a modification of traditional silvicultural practices within the general forest management area. The Connectivity/Diversity Blocks would employ prescriptions similar to those described for the low retention portion of Alternative C. Although the Late-Successional Reserves under the PRMP would use non-traditional silvicultural techniques and objectives, modeling is not an issue in these areas because the reserves are not part of the PSQ computation.

Tables BB-1 through BB-7 in Appendix BB display harvest volumes by age class for the first, second, third, fifth, and tenth decades of the plan for each of the seven alternatives. Regeneration harvest refers to a harvest where most of the standing trees are removed and a new stand is established. Thinning or density management refers to a silvicultural practice that typically removes about 30 to 40 percent of the volume during any one entry.

Some additional volume—in the form of density management—will be derived from the Late-Successional Reserves and Riparian Reserves to meet the aquatic conservation strategy or to develop late-successional stand characteristics. Volume could also result from the harvest of rights-of-way or salvage opportunities within Late-Successional Reserves and Riparian Reserves or on other lands not available for regular harvest. This volume would not contribute to the computation of the PSQ. For the Coos Bay District, this volume is estimated to be approximately 1 MMBF per year.

Table 4-28. Probable Sale Quantity (PSQ) of the Alternatives by MMBF and MMCF [1]

		PSQ by Decade						
Decade	Unit	PRMP	NA	A	B	C	D [2]	E
1	MMBF	32.1	254.4	293.9	267.0	85.9	76.0	65.1
	MMCF	5.33	40.1	46.2	41.9	14.0	13.5	10.7
2	MMBF	32.3	225.0	288.2	256.7	83.1	81.5	61.3
	MMCF	5.33	40.1	46.2	41.9	14.0	13.5	10.7
3	MMBF	32.1	201.0	267.1	238.1	82.0	123.4	60.6
	MMCF	5.33	40.1	46.2	41.9	14.0	21.1	10.7
5	MMBF	31.0	187.9	263.1	236.0	89.4	169.3	60.4
	MMCF	5.33	40.1	46.2	41.9	14.0	29.0	10.7
10	MMBF	31.0	217.0	261.2	230.6	86.6	149.4	60.5
	MMCF	5.33	40.1	46.2	41.9	14.0	30.2	10.7

[1] Even flow was calculated based on coniferous volume only.

[2] The 50-11-40 Rule does not provide for even flow.

Allowable Cut Effect

> "Allowable Cut Effect (ACE) - The immediate increase in the current allowable sale quantity (ASQ) which is justified by expected future increases in yields due to present or proposed management treatments."

The ACE may be produced if future growth rates exceed current growth rates. As the long-term average growth rate increases, volume produced between the current and average growth rate may be scheduled for harvest. That portion of an ASQ attributed to yields from increasing growth rates is the ACE. ASQ refers to a non-declining sustainable even flow timber harvest over a long period of time. See Appendix U for a more complete description of ACE.

Sensitivity Analysis

A change in the PSQ for the PRMP was examined for scenarios where a number of silvicultural practices were not used. If no genetic stock were used, the PSQ would decrease by less than one percent. If no genetic stock were used and fertilization were not done, the PSQ would be reduced by less than one percent. If no genetic stock were used, no precommercial thinnings were conducted, and fertilization were not done, the PSQ would be reduced by 8.6 percent. If no intensive practices were used, the PSQ would decrease by 8.9 percent.

If the current critical northern spotted owl habitat were not available for timber harvest, the PSQ would be reduced by 8.9 percent.

Acres Harvested Per Decade

In general, the number of acres that receive regeneration harvest treatments each year is related to the planned rotation length. With a 60-year rotation on a regulated forest, annual regeneration harvest acreages should equal approximately 1/60 of the total regulated acres. Under Alternatives C, D, and the Connectivity/Diversity Blocks of the PRMP—which specify rotations ranging between 150 to 300 years on some areas—the annual acreage receiving regeneration harvest would be much smaller than for the shorter rotations of intensively-managed lands of the other alternatives.

Acres of Forest Land Converted to Roads

Construction of new permanent roads, landings, and rock quarries would reduce the total acres of land available for timber production. Roads would be constructed to provide access to BLM timber sale areas and to adjacent non-BLM-administered lands under the terms of reciprocal right-of-way agreements or permits. The reduction in forest land acreage resulting from road construction would continue for several decades until all roads necessary to manage lands allocated to timber production were constructed. This length of time would vary by alternative.

A greater amount of land would eventually be occupied by permanent roads under Alternatives NA, A, and B, which have the largest allocations of land to timber production. Table 4-29 displays the total mileage of additional permanent roads and acres planned for the road system for the first and fifth decades of the plan for each alternative. The acreage includes areas such as the road surface, ditches, turnouts, landings, cut slopes, and fill slopes which would be taken out of production. Dedication of land to permanent roads has an unavoidable adverse effect of removing land from production of timber products. On the other hand, roads are necessary to provide access for management purposes such as reforestation, stand maintenance, fire protection, and monitoring.

The loss of timber production acres would, however, be minimized by (1) careful advance planning in making effective use of available logging systems to minimize the total length of road system needed, (2) building roads only to the minimum width required for the expected use of each road, and (3) avoiding unnecessarily-wide clearing limits in road design and construction.

Age Class Distribution of the Future Managed Forest

The rotation age at which timber stands are harvested helps to determine the age and size characteristics of the future forest. Under all alternatives except C, the average age and diameter of harvested trees on the intensively-managed lands would decline significantly over the first few decades but then slowly increase as the forest approaches regulation. Under Alternatives A, B, and the PRMP, intensively-managed lands would take longer to reach regulation than the other alternatives and therefore smaller diameter trees would be harvested for a longer period than under the other alternatives.

The future forest would contain more acres of mature and old-growth seral stages under Alternatives C and the PRMP than under Alternatives A and B which have shorter rotations. Under Alternative C, a large number of acres would be managed on rotations of 150 to 300 years. Under the PRMP, a large number of acres would be managed as Late-Successional

Table 4-29. Additional Miles and Acres of Roads in First and Fifth Decades by Alternative

	Alternative						
	PRMP	NA	A	B	C	D	E
1st Decade							
Miles	186	169	245	223	132	164	124
Acres	1,010	1,014	1,510	1,283	744	916	692
5th Decade							
Miles	12	11	15	14	8	10	8
Acres	65	66	88	80	47	57	43

Reserves, Riparian Reserves or Connectivity/ Diversity Blocks.

Table 4-30 compares the average age at regeneration harvest by decade for each alternative. In the constrained management areas, Alternatives B, C, E, and the PRMP show a slight reduction in average age at harvest or no change at all during the first few decades. Constrained management areas would include areas such as VRM II, rural interface areas, Connectivity/Diversity Blocks, or any other areas that are managed on a long rotation. These areas require additional consideration for resources other than timber production. Alternatives NA and D show a gradual decline in average age of harvested timber. In the intensively managed areas under Alternatives NA, A, B, E, and the PRMP, most stands would be harvested at or near the minimum harvest age during the first few decades. Under Alternative C, the average age of harvested trees would eventually start to increase, equaling or exceeding CMAI. Management under Alternatives A, B, and the PRMP would allow harvest to continue at the minimum harvest age beyond the 10th decade. By the 20th decade, or later, average harvest age for Alternatives A and B would increase. Such delays in reaching CMAI would significantly postpone the time for the managed forest to reach its maximum productive capacity.

Other Effects of the Alternatives

Some effects that are not easily quantifiable between alternatives are listed and discussed below:

- Retention of Green Trees and Dead-and-Down Material
- Risks of Insect and Disease
- Wood Quality of Harvested Trees
- Reforestation
- Genetic Selection
- Stand Management Practices
- Land Exchanges
- Adjustment of Riparian Reserves
- Protection Buffers, Survey and Manage Requirements, and Protection of Bat Roost Sites
- Long-term Site Productivity

Retention of Green Trees and Dead-and-Down Material

Under Alternatives C, D, E, and the PRMP, some live trees and/or snags would be retained within the harvested area (see Appendix K). In most cases, these trees would never be harvested, but would provide a source of snags and/or elements of structural diversity for the future forest. The number of trees retained varies by alternative and from one land use allocation to another within Alternatives C and the PRMP.

When merchantable live trees and dead-and-down material are reserved within harvest areas, there would be a reduction in yield to account for volume not being removed. Where any overstories were retained, there could be an additional reduction in growth of the next stand. The TRIM-PLUS model used reduced yields to account for trees being retained on harvested units and for reduced growth due to competition of an overstory. In general, growth reductions due to overstory competition would depend on how the retained trees are distributed; the position of the individual trees or clumps within the unit; the size of retained trees; and the aspect, size, and shape of the harvest unit. Additional competition from adjacent unharvested stands could occur. Considering these various factors, the PSQ of the PRMP has been reduced to allow for growth reductions in future stands that compete with a retained overstory.

Retaining trees that display characteristics such as limbiness, excessive taper, and crooks or forks would have the potential for transmitting to subsequent stands those traits that are genetically determined.

Risks of Insects and Disease

Silvicultural practices used to achieve management objectives could lead to increased incidence of insects and diseases and subsequent loss of yield. Risks include:

- Green tree retention regimes have a higher potential to spread diseases from existing infected trees to regenerated trees when compared to clearcutting.

- Thinning or partial cutting can result in physical damage—especially on steep or broken terrain—to remaining trees, predisposing them to insect or disease attack and leading to reduced yield and value. This is especially true of silvicultural systems that require more than one entry into stands.

- Thinning entries can spread black stain fungus, especially in stands with soil compaction that resulted from previous tractor logging.

Table 4-30. Average Age at Regeneration Harvest for Constrained and Intensive Management by Decade

Constrained Management

	Decade					
Alternative	1	2	3	5	10	20
PRMP [1]	80	70	120	150	150	150
NA	360	310	280	250	170	190
A	N/A	N/A	N/A	N/A	N/A	N/A
B	150	150	150	150	150	150
C	130	120	100	N/A	230	200
D	120	120	120	70	70	70
E	150	150	150	150	150	150

Intensive Management [2]

	Decade					
Alternative	1	2	3	5	10	20
PRMP [3]	100	80	80	60	60	60
NA	210	80	60	40	60	120
A	210	130	60	50	50	80
B	210	130	60	50	40	60
C [4]	-	-	-	-	-	-
D	130	120	120	80	70	50
E	120	60	50	40	50	110

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[1] Connectivity/Diversity Blocks and VRM Class 2 management.

[2] 40-60 year rotation or minimum harvest age.

[3] General Forest Management Area.

[4] No areas included in intensive management for any of the decades.

- Spread of the laminated root rot fungus, *Phellinus weirii*, may be accelerated by intensive management regimes such as those proposed for Alternatives A, B, and the NA. Under all of the alternatives, identified infection sites would be replanted with tree species that are resistant or immune to the disease. However, the disease may continue to spread from infected areas that are not detected prior to planting.

Wood Quality of Harvested Trees

Wood quality refers to the physical characteristics of harvested logs and their suitability to produce valuable wood products. The most important wood quality factors are log size; wood density and strength; number, size, and type of knots; and proportion of juvenile wood.

Larger logs generally command a higher price per unit of measure than smaller logs because, in general, the larger diameter trees are more economical to fall, yard, and transport and can be converted into a greater variety of higher value wood products. To produce larger logs, timber must be grown either for long periods of time or at lower densities to allow more rapid diameter growth.

Wood density is closely related to strength which, in general, is related to the proportion of spring to summer growth, juvenile to mature wood, and genetic characteristics of the tree.

Knots are produced when wood is formed around live or dead limbs. The larger the limbs, the larger the knots. Generally, product value is reduced as the number and size of knots in the wood increase. Trees grown in lower density stands are likely to have more and larger limbs—and therefore more and larger knots—than trees grown in higher density stands.

Juvenile wood refers to the wood that forms in the portion of a tree within the live crown. Juvenile wood typically has lower density and strength with a greater tendency to warp than mature wood which forms in the part of a tree below the crown. Logs that contain high proportions of juvenile wood typically would have lower product values.

Under Alternatives NA, A, B, E, and the GFMA portion of the PRMP, timber management practices are designed to maintain well-spaced stands and rapid growth, with harvests scheduled on short rotations (40 to 60 years). This combination of factors is likely to result in the production of wood of lower quality and value per unit volume in the future than under the longer rotations of Alternatives C, D, and the Connectivity/Diversity Blocks of the PRMP.

Under Alternatives C and D, and in the Connectivity/Diversity Blocks under the PRMP, some timber stands would be managed at wider spacings than under the other alternatives. Trees grown on such regimes are expected to have very large diameters, but are also likely to be limby and have low-to-medium density wood, large knots, and a large core of juvenile wood.

In some areas, wood quality may be improved by pruning of young stands. By removing the limbs from the lower portion of the stem of crop trees, a greater proportion of clear wood and a lower proportion of juvenile wood can be produced.

Reforestation

Under all alternatives, it is assumed that harvested areas will usually be reforested within one growing season after site preparation, with an adequate number of seedlings of desired tree species. Reforestation estimates do not project full stocking to target levels on all harvested acres, but assume that high levels of reforestation success will continue.

Under Alternatives NA, A, B, D, E, and the General Forest Management Area in the PRMP, most regeneration would consist of planted tree seedlings. Under Alternatives C and the Connectivity/Diversity Blocks in the PRMP, a greater amount of natural regeneration would be expected. Retained trees left in the harvested units would provide a close seed source for natural regeneration.

Genetic Selection

Under all alternatives except C, genetically-selected seedlings would be planted following regeneration harvest, to the extent that selected seed is available. Under Alternative C, genetically-selected seedlings would comprise not more than half of the trees planted following regeneration harvest.

Reforestation efforts have the potential to change the genetic makeup of forest stands, whether seedlings were produced through a genetic selection program, obtained from general seed collection, or established naturally from sources such as seed trees. Use of carefully selected and tested sources of parent material can assure that key gene combinations are not lost. Controlling the parental makeup of seed lots and planting of seedlings well adapted to local conditions can reasonably assure natural adaptability to site and disease. The numbers of trees being retained under Alternatives C and the PRMP would add to the genetic diversity of the regenerated stands.

All alternatives would provide a network of trees throughout the landscape in the form of Riparian Management Areas or Riparian Reserves. TPCC woodland blocks and administrative withdrawals would also add to the genetic makeup of the stand. Although this addition of untested reproductive material could add both desirable and undesirable traits, its general contribution to the genetic diversity of the regenerated stand in the long term would add some assurance that the locally-adapted genetic pool is not lost. The design of tree selection and breeding programs should prevent excessive narrowing of gene pools or the complete loss of genetic traits. Moreover, genetic selection may provide the only viable method of protecting genetic material in species such as Western white pine or sugar pine whose existence is threatened by plant diseases.

Use of genetically-selected trees should result in accelerated growth rates and earlier attainment of merchantable trees, as well as more rapid development of old-growth type structure. Under all alternatives except C and the Connectivity/Diversity Blocks of the PRMP, the PSQ would reflect anticipated future yield increases from stands of genetically-selected trees where stands are harvested within 100 years. In Alternative C and the Connectivity/Diversity Blocks of the PRMP, no future yield increases would be projected due to the uncertainty of the long-term contribution of the genetically-selected trees.

See Appendix L for a more complete discussion of the tree improvement program.

Stand Management Practices

A variety of intensive stand management practices would be implemented under every alternative. Tables CC-1 through CC-7 of Appendix CC display the projected acres of each practice by decade and alternative. These acreage figures have been estimated for the purpose of analyzing potential environmental impacts. Actual acres of each type of harvest and stand treatment would vary by year in the course of implementing the plan.

Appendix DD describes the effects of intensive silvicultural practices on economic values.

The anticipated effects of the stand management practices that would be implemented are described below:

Precommercial Thinning (PCT)

PCT would be applied to overstocked young stands under all alternatives on sites allocated to timber production. PCT under Alternatives C and the Connectivity/Diversity Blocks of the PRMP would promote density management objectives. Alternatives NA and the PRMP would treat considerably more acres than the other alternatives during the first two decades.

PCT would help maintain stand vigor by increasing growing space, eliminating poorly formed or undesirable trees, reducing root competition, and delaying crown closure. Thinned stands produce larger diameter trees than stands that are overstocked.

There may be some negative effects of PCT. For instance, PCT can assist in the spread of black stain fungus, especially in stands where soil compaction has occurred. Slash resulting from PCT places a stand at increased risk of a stand replacement fire for several years.

Overall, PCT usually results in a small increase in the PSQ, allows earlier development of a merchantable stand, provides an opportunity to control density and species composition, and eliminates poorly formed and diseased trees early in the life of the stand.

Commercial Thinning

Commercial thinning, or density management harvest, is planned under all of the alternatives. Under Alternatives NA, A, B, D, E, and the GFMA portion of the PRMP, commercial thinning would be applied to young, well-stocked stands. An estimated 50 to 60 percent of such young stands would be suitable for thinning based on inventory data, topography, location, density of trees, road locations, and other site-specific information.

Commercial thinnings can produce an increase in total net yield and result in a higher PSQ. The yield increase results from early harvest of merchantable trees which otherwise would have died and become unusable before final harvest of the stand. The increased PSQ is a result of a combination of proper timing of intermediate harvests and a higher total yield over a rotation. Depending on spacing of residual trees, thinning also can result in production of larger trees with higher stumpage values and lower logging costs at regeneration harvest.

In the Connectivity/Diversity Blocks of the PRMP and under Alternative C, density management harvest in young stands would increase the rate at which large trees, multiple canopy layers, and structural diversity are produced in these stands.

If thinning is not carefully implemented, it can damage the tops, crowns, bark, and roots of residual trees. Such damage would reduce wood quality and increase the risk of insect and disease attacks. Commercially-thinned stands—particularly those not subjected to prior spacing management through precommercial thinning—may be more susceptible to windthrow, depending on their locations.

Forest Fertilization

Fertilization of some managed stands would take place under all of the alternatives. Effects would include higher growth rates, earlier production of merchantable trees, and increased resistance to insects and disease. Also, under Alternatives NA, A, B, D, E, and the General Forest Management Area (GFMA) of the PRMP, the PSQ would reflect expected future gains resulting from fertilization. No gains in PSQ would be projected under Alternative C, or in the Connectivity/Diversity Blocks of the PRMP, where stands are managed on long rotations.

Vegetation Control

Control of competing vegetation under all alternatives as provided by the ROD for *Western Oregon Program-Management of Competing Vegetation* (see Appendix I-C of the draft RMP) would permit the survival and growth of an adequate number of commercial species tree seedlings in each regenerated area. The effect of such vegetation control would be more rapid re-establishment of forest conditions, a greater total yield of timber from each acre, and a correspondingly higher PSQ level.

For purposes of growth and yield projections, it was assumed that effective methods of vegetation control would be available and would be implemented as needed. These methods could include prescribed fire, herbicides, and manual or mechanical methods as appropriate.

The timber yields that have been projected are dependent upon successful control of competing vegetation, whatever method is employed. If herbicides are not available or cannot be applied, necessary vegetation management would be accomplished by other methods. In the cases of Alternatives C and the PRMP—where the distribution of retention trees may prohibit aerial application of herbicides—costs of alternative methods of vegetation control may be higher.

Pruning

In the PRMP, pruning of managed stands could occur in suitable stands where the cost of the practice would show a positive present net value. Pruning at least the first log approximately 10 years after PCT could produce lumber that has tight knots or is knot-free, and would also reduce the proportion of juvenile wood. The lower occurrence of knots and juvenile wood characteristics would result in a higher quality product. Pruned stands could also have a reduced risk of crown fires once the pruned limbs have decayed.

Land Exchanges

Under all alternatives, efforts to negotiate land exchanges should result in improved and more efficient management of BLM-administered lands. When land exchanges result in acquisition of lands that would be allocated to timber production, the projected PSQ may change. PSQ changes would depend on site conditions, acreages, and changes in timber inventory and in age class distribution. Any exchanges of commercial timberland for tracts that would be allocated to non-timber uses would result in a decrease in the PSQ. The types of land that would be considered for exchanges would vary by alternative. To date, approximately 25,000 acres of district land and 45,000 acres of private land have been identified in three separate proposals as a pool of acres available for exchange. These proposals are in the very early stages of negotiations and are not defined sufficiently to evaluate effects.

The draft Coquille Tribe Self Sufficiency Plan proposed the establishment of the "Coquille Forest." Any change in jurisdictional administration of the approximately 59,000 acre "Coquille Forest" from BLM to BIA would require a recomputation of the PSQ.

Adjustment of Riparian Reserves

Under the PRMP, the prescribed widths of Riparian Reserves are intended to be interim until the completion of watershed analysis that will enable managers and interdisciplinary teams to determine the appropriate width to meet the objectives of the Riparian Reserves. Post watershed analysis Riparian Reserves for permanently-flowing streams should approximate the boundaries prescribed in the PRMP. However, post-watershed analysis Riparian Reserve boundaries for intermittent streams may be different from those prescribed in the PRMP. These adjustments of Riparian Reserves could increase or decrease the acreage of Connectivity/Diversity Blocks and General Forest Management Area. This variability of Riparian Reserves on intermittent streams contributes an element of uncertainty to the PSQ calculation.

It is also possible that watershed analysis could indicate the need to defer harvest in some watersheds for one or more decades. The number, size, and location of watersheds that may need to have harvest deferral is unknown as is the amount of time of the harvest deferral. With the Riparian Reserves and Aquatic Conservation Strategy of the PRMP, the number of watersheds that may require harvest deferral may be less than those alternatives with less protective watershed strategies. The possibility of watershed harvest deferrals and their magnitude is an uncertainty that is not reflected in the PSQ calculation.

Protection Buffers, Survey and Manage Requirements, and Protection of Bat Roost Sites

The Management Action/Direction for the PRMP as described in Chapter 2, identified 12 species to have protective buffers. Only 3 of these species are known to occur on the district; the other 9 are suspected to occur. Of the 376 SEIS Special Attention Species listed in Appendix G requiring additional survey strategies, 25 are known to occur on the district and 283 are suspected to occur on the district. Additional protection for caves, mines, and abandoned wooden bridges and buildings that are used as roost sites for bats is also required. As surveys are conducted, the number of species confirmed to occur and/or populations of species could result in an increase in additional protective buffers and management of additional managed sites. The total extent of species and sites is unknown.

Long-term Site Productivity

Some researchers suggest that long-term site productivity may not be sustainable under intensive management regimes such as those proposed for Alternatives NA, A, and B. Soil fertility may be diminished over time by repeated cycles of harvest, site preparation, and control of competing vegetation (Perry and Maghembe 1989).

The FORCYTE-11 model was used to predict long-term site productivity. It shows decreasing site productivity for areas harvested on short rotations (40 years) followed by light or moderate intensity broadcast burns. Most of the broadcast burns for all alternatives are expected to be of light-to-moderate intensity. Site productivity can be maintained when rotation lengths of 60 years or longer are practiced if burning intensities are light and all other factors are the same. When moderate burning along with 60-year rotations are examined using the FORCYTE-11 model, the results are mixed and indicate that long-term site productivity is either being maintained or decreasing very slightly. However, one of the assumptions of such a scenario is that after each harvest, the site would receive a moderate burn. Such a scenario is not likely especially if remaining harvests are in young stands that will have light fuel loading. Under Alternatives C and the PRMP, rotation ages vary from 60 years to 300 years and in almost all cases would not reduce long-term site productivity. (For additional information on long-term site productivity, see Effects on Soils.)

Other potential impacts to long-term site productivity are being studied by the scientific community. Specific and conclusive results are not yet available, but some important observations appearing in scientific literature are listed below:

- Use of shorter rotations appears to lead to more rapid depletion of nitrogen in forest soils. Nitrogen depletion would result in a reduction of long-term site productivity unless mitigated by periodic application of nitrogen fertilizer to the site.

- Use of silvicultural prescriptions that increase temperature regimes at the soil surface have a potential adverse impact on long-term site productivity. This reduced productivity is due to a loss of soil nitrogen (Borchers et al. 1990) and also a loss of important soil mycorrhizae (Parke and Trappe 1983) related to increased temperatures.

- Silvicultural regimes that do not retain species diversity may also have an adverse impact on long-term site productivity. Studies indicate that the growth of beneficial mycorrhizal fungi and other nitrogen-fixing soil organisms is associated with the presence of certain hardwood species (Borchers and Perry 1990, Amaranthus and Perry 1990).

Timber Supply

An analysis of the timber supply for the Coos Bay District has been conducted by the Pacific Northwest Research Station (USDA Forest Service). (See Appendix EE for a description of the analysis.) That study modeled the timber supply from each of the ownership categories in western Oregon. Timber supply from BLM in the Coos Bay District under each alternative was then included, and overall economic timber supply for 1993-2000 was estimated. In this process, the private timber supply was adjusted to account for price changes attributable to the different levels of BLM timber supply by alternative. A similar process was followed to estimate the outlook for the 2000-2010 period. The results of this study are displayed in Table 4-31. Because this model has not been validated, its predictive capability is uncertain. However, it is useful for comparison of alternatives.

Compared to the 1984-88 baseline period, total timber harvest in the Coos Bay District would decrease under all alternatives. The change in timber harvest would range from a 2 percent decrease in Alternative A, to a 22 percent decrease in the PRMP.

The timber supply analysis estimated the amount of timber that would be harvested in the district by all sources from 2001 to 2010 using the same assumptions as for the previous period. The results indicate total harvest for any given alternative would increase slightly from the first decade.

Due to the fact that a portion of the raw logs harvested in the district is processed outside the district, the changes in available supply would affect areas outside the district also, but to a lesser degree. Similarly, these log flows affect the quantity of wood processed in the lumber and wood products industry in the district. Both inflows and outflows of logs affect the amount of wood actually processed in the district. Estimates of the amount of wood processed are shown in Table 4-31, and overseas log exports are not excluded. The wood processing sector would consume less wood under Alternatives C, D, E, and the PRMP than during the reference 1984-88 period. Differences between the amounts processed under different alternatives may be attributed to their PSQ levels.

The cumulative effects of the alternatives are shown in Table 4-32. This table shows projected timber harvests in western Oregon based on the assumption that each BLM district adopts the same alternative. The table does not include harvests in Klamath County because BLM's share of total harvests there is very small.

Compared to the 1984-88 baseline, BLM harvests would range from a 6 percent decrease in Alternative NA, to an 82 percent decrease in the PRMP. Total harvests in western Oregon would decline under all alternatives, principally due to decreases in harvests on the National Forests. Total harvests would also decrease in all of the alternatives in the 2001-2010 time period, though they would be greater than harvests during the 1993-2000 time period.

Timber processed in western Oregon during 1993-2000 would also decrease under all alternatives. Logs exported overseas are included in this total.

Table 4-31. Coos Bay District Timber Harvest Per Year (1993-2000) (In Millions of Cubic Feet [MMCF])

Supplier [1]	1984-88 Baseline	PRMP	NA	A	B	C	D	E
			Alternative					
BLM [2]	42	6	40	46	42	14	14	11
USFS [3]	25	2	2	2	2	2	2	2
Private (industrial & non-industrial)	92	113	110	108	109	112	112	113
Other Public	13	13	13	13	13	13	13	13
Total	172	134	165	169	166	141	141	139

Data source: Non-BLM harvest projections from Timber Supply Analysis for BLM Planning, USDA-USFS, PNW Research Station, Portland, OR, 1992. (revised 1994)

Coos Bay District Annual Timber Harvest Per Year (2001-2010) (In Millions of Cubic Feet [MMCF])

	1984-88 Baseline	PRMP	NA	A	B	C	D	E
Total	172	136	168	173	169	144	143	140

Data source: Non-BLM harvest projections from Timber Supply Analysis for BLM Planning, USDA-USFS, PNW Research Station, Portland, OR, 1992. (revised 1994)

Coos Bay District Timber Processed Per Year (1993-2000) (In Millions of Cubic Feet [MMCF])

	1984-88 Baseline	PRMP	NA	A	B	C	D	E
Total	183	136	169	176	172	144	144	141

Notes:

1) Timber Processed from all sources was partitioned on county boundaries to approximate the BLM District, with the exception of the coastal portion of Douglas County which was included in the Coos Bay District.

(2) This analysis accounts for historic patterns of log flows across county boundaries.

(3) Assumes all BLM districts have implemented the same alternative.

(4) Includes logs exported overseas.

Data Source: Timber Supply Analysis for BLM Planning, USDA-USFS, PNW Research Station, Portland, OR, 1992. (revised 1994)

[1] Non-BLM supply partitioned to approximate BLM District. The coastal portion of Douglas County was included in Coos Bay District.

[2] Baseline data from BLM Facts, USDI-BLM. Converted from board feet using a factor of 6.2 bd. ft. per cu. ft.

[3] Assumes implementation of the President's Forest Plan.

Table 4-32. Western Oregon Timber Harvest Per Year (1993-2000) (In Millions of Cubic Feet [MMCF])[1]

	1984-88	Alternative						
Supplier	Baseline	PRMP	NA	A	B	C	D	E
BLM	199	35	187	250	224	67	74	56
USFS[2]	376	60	60	60	60	60	60	60
Private (industrial & non-industrial)	603	640	618	610	614	634	634	638
Other Public	62	64	62	64	64	64	64	64
Total	1,240	799	927	984	962	825	832	818

Data source: Non-BLM harvest projections from Timber Supply Analysis for BLM Planning, USDA-USFS, PNW Research Station, Portland, OR, 1992. (revised 1994)

Western Oregon Timber Harvest Per Year (2001-2010) (In Millions of Cubic Feet [MMCF])

Total	1,240	928	1,068	1,124	1,102	959	964	947

Data source: Non-BLM harvest projections from Timber Supply Analysis for BLM Planning, USDA-USFS, PNW Research Station, Portland, OR, 1992. (revised 1994)

Western Oregon Timber Processed Per Year (1993-2000) (In Millions of Cubic Feet [MMCF])

Total	1,294	858	987	1,049	1,019	886	892	876

Notes:

(1) Timber Processed from all sources was partitioned on county boundaries to approximate BLM Districts, with the exception of the coastal portion of Douglas County which was included in Coos Bay District.
(2) This analysis accounts for historic patterns of log flows across county boundaries.
(3) Assumes all BLM districts have implemented the same alternative.
(4) Includes logs exported overseas.

[1] Totals do not include Klamath Falls Resource Area.

[2] Assumes implementation of the President's Forest Plan.

Data Source: Timber Supply Analysis for BLM Planning, USDA-USFS, PNW Research Station, Portland, OR, 1992 (revised 1994)

Effects on Energy and Mineral Resources

Introduction

Allocations and management prescriptions of other resource programs affect the availability of land for exploration and development of energy and mineral resources differently throughout the alternatives. To assess these effects, constraints have been divided into four categories: (1) closures including withdrawals, (2) no surface occupancy for leasable minerals, (3) standard requirements or stipulations, and (4) additional restrictions, such as seasonal operating and visual resource management constraints. Closures to mineral resource development of locatable, leasable, and salable minerals have been further divided into discretionary (under the control of BLM) and nondiscretionary (previously imposed by law, regulation, or Secretarial or Executive order).

The projected future exploration and development of mineral resources on the Coos Bay District is presented in the Ten-Year Mineral Development Scenarios in Appendix W. The most favorable condition for exploration and development of mineral resources would be where there are few mining restrictions. Any additional measures for the mitigation of disturbance to lands and non-mineral resources would cause greater impacts to mineral exploration and development.

Tables 4-33 through 35 show, by alternative, the acres of mineral estate considered to have high, moderate, or low mineral potential that are available for mineral exploration and development, as well as the acreage where such exploration and development would be restricted. Generally, Alternatives A, B, and No Action (NA) would have the most acres of land with high and moderate potential available for mineral development. In contrast, Alternatives C, D, E, and the Proposed Resource Management Plan (PRMP) would have increasingly more restrictions on the availability of such lands for mineral development.

All types of mineral development involve some disturbance. The commitment to resources other than those being extracted would be temporary. The lands disturbed in most mining methods would be rehabilitated as prescribed by regulation and/or law with the one exception being a large open pit operation where a longer commitment of the surface resources within the pit would be lost to other uses.

The irreversible and irretrievable commitment of resources would be the amounts of mineral commodities actually removed, and the methods of extraction utilized, from the public lands.

Leasable Minerals

Under all alternatives, many of the lands in Land Tenure Zones 2 and 3 where land disposals or acquisitions could occur have been classified as having moderate-to-high potential for the occurrence of oil and gas. If the BLM retains the mineral estate in any disposal by exchange or sale, a split estate results. In these situations, there would be a minor negative impact from additional administrative requirements in permitting leasable mineral activity on the reserved mineral estate.

Under all alternatives, less than 0.5 percent of the lands in the operating area would be closed (discretionary and nondiscretionary) to mineral leasing. Therefore, under all alternatives, over 99.5 percent of the lands are open to mineral leasing as shown in Table 4-33. The partial revocation of the withdrawals would open those lands to mineral leasing under all alternatives. As described in Table 2-9 in Chapter 2, there are several special leasing stipulations that would be used under the PRMP. The No Surface Occupancy and Controlled Surface Use stipulations would be used to protect fragile surface resources, as well as Riparian Reserves. Under all alternatives, compliance with the No Surface Occupancy stipulation on certain mineral leases may result in additional expenses for the lessee to conduct exploration and/or development of the leasable minerals. Considering the road density on most lands in the district, it is not anticipated that the required use of existing roads on a lease with the Controlled Surface Use stipulation would present a significant negative impact to a lessee. Use of existing roads would result in a savings to the lessee. Timing stipulations that would be used on some tracts of land under the PRMP, NA, and Alternatives C, D, and E could add additional costs for the lessee in conducting operations on the leasehold.

As stated with each stipulation in Appendix M, there could be situations where those stipulations may be excepted or modified. The restrictive nature of some of the stipulations could be considerably reduced depending on the type of operation proposed.

Since oil and gas geophysical operations, drilling, and small field development are predicted to occur under all alternatives, no exploration or development opportunities would be foregone by industry. Additional costs might be incurred, however, by a lessee under the more restrictive PRMP and Alternatives C, D, and E where the Controlled Surface Use stipulation would be utilized on large tracts of land to protect Late-Successional Reserves, biodiversity, old-growth stands, or habitat of the northern spotted owl. Under all alternatives except the PRMP, the Controlled Surface Use stipulation would be utilized on leases containing riparian management areas. This stipulation could restrict drill site construction and access to established roadways. Under the PRMP, a No Surface Occupancy stipulation would be applied within the Riparian Reserves.

With regard to geothermal resources, it is anticipated that no drilling of temperature gradient holes or geothermal wells would occur under any alternative. Considering the lack of geothermal resources, no exploration opportunities would be foregone by any of the alternatives.

Locatable Minerals

Under all alternatives, lands within recreation areas and reconveyed land not opened to locatable mineral entry would be closed to mining claim location. Because most of these areas are believed to be within areas considered to have low potential for locatable mineral resources, these withdrawals are not expected to have a significant impact.

Table 4-34 shows the effect of each alternative on the availability of lands for locatable mineral activities. Under Alternatives NA, A, B, and E over 97 percent of the lands in the planning area would be open for locatable mineral operations. Under the PRMP and Alternatives C, D and E, over 96 percent of the lands in the planning area would be open for locatable mineral operations. These three alternatives would provide for the closure of more lands with fragile surface resources by withdrawing those acres from mining claim location, and most of these areas are considered to have low potential for locatable mineral resources.

Under all alternatives, withdrawals from locatable mineral entry on the North Spit of the Coos Bay would prohibit mineral exploration or development on approximately 2,000 acres considered to have high potential for pure silica sand. Under all alternatives, the open pit sand exploration and mining operations as described in Appendix M would be foregone.

If any suitable scenic or recreational rivers were designated under the PRMP and Alternatives C, D, and E, any mining claims eventually patented would involve only the mineral estate; the surface estate would remain in public ownership. Since all the suitable river corridors are in areas considered to have low potential for locatable mineral resources, there is little effect anticipated on locatable mineral exploration and development by scenic or recreational river designation under these four alternatives. Also, under these alternatives, Research Natural Areas, Areas of Critical Environmental Concerns, and the Environmental Education Area could be withdrawn from locatable mineral entry. These withdrawals would prohibit exploration or development of 9,500 acres. Some hobby mineral collecting and rock-hounding is expected to be foregone on these lands under these four alternatives.

Under the PRMP and Alternatives C, D, and E, the establishment of Special Recreation Management Areas (SRMAs) might reduce the amount of exploration for locatable minerals on those acres. The establishment of SRMAs would have little effect on existing mining claims, except if the claimant did not file the required affidavit of annual assessment work with the BLM's Oregon State Office, in which case the mining claim could not be relocated since the area would be withdrawn from new mining claim locations. Increased recreational mining activities could occur along creeks if existing mining claims were abandoned or if currently private-owned lands were acquired by the BLM. Acquisition of approximately 700 acres within the proposed boundaries of SRMAs would reduce inadvertent trespass by the public, as well as facilitate management of recreation areas. Establishment of other SRMAs under these four alternatives would increase the number of acres closed to locatable mineral entry (see Table 4-34).

Salable Minerals

Under all alternatives, salable mineral activities may be affected by special status plant or animal species and the location of cultural sites at or near developed mineral sites or prospective sites. Under all alternatives, seasonal restrictions could be applied to salable mineral extraction from any quarry located near wildlife nest sites. See Table 4-35 for percentages of land that would be closed, open with some restrictions, and open to salable mineral activities.

Since no sand and gravel operations currently occur on any BLM-administered lands in the planning area, the protection of riparian management areas under all alternatives is anticipated to have no effect on the salable minerals of sand and gravel. Utilization of the existing rock quarries that occur within riparian management areas at several locations is not expected to impair the riparian areas.

The restriction to timber harvesting in certain areas under many of the alternatives could impact the availability of some rock quarries for site expansion. New quarry site development or the expansion of existing quarry sites would not be allowed where the vegetation is to be protected in the following areas: designated mature and old-growth forest blocks (Alternative B), old-growth restoration and retention blocks (Alternative C), habitat conservation areas for the northern spotted owl (Alternative D), forest stands older than 150 years (Alternative E), and Late-Successional Reserves and Connectivity/Diversity Blocks (the PRMP). Salable minerals could be removed from within the boundaries of existing sites in these areas under all alternatives.

Under the PRMP and Alternatives NA, C, D, and E the designation of SRMAs could affect the availability of existing and potential salable mineral resources in those areas. Use of salable mineral resources from sites within the boundaries of a SRMA would be reviewed on a case-by-case basis by the Authorized Officer. If the impacts of such use were acceptable, the salable mineral use could be permitted.

Development of two new quarry sites is expected to be foregone under Alternatives D and E, primarily due to the decreased demand for salable minerals under these two alternatives.

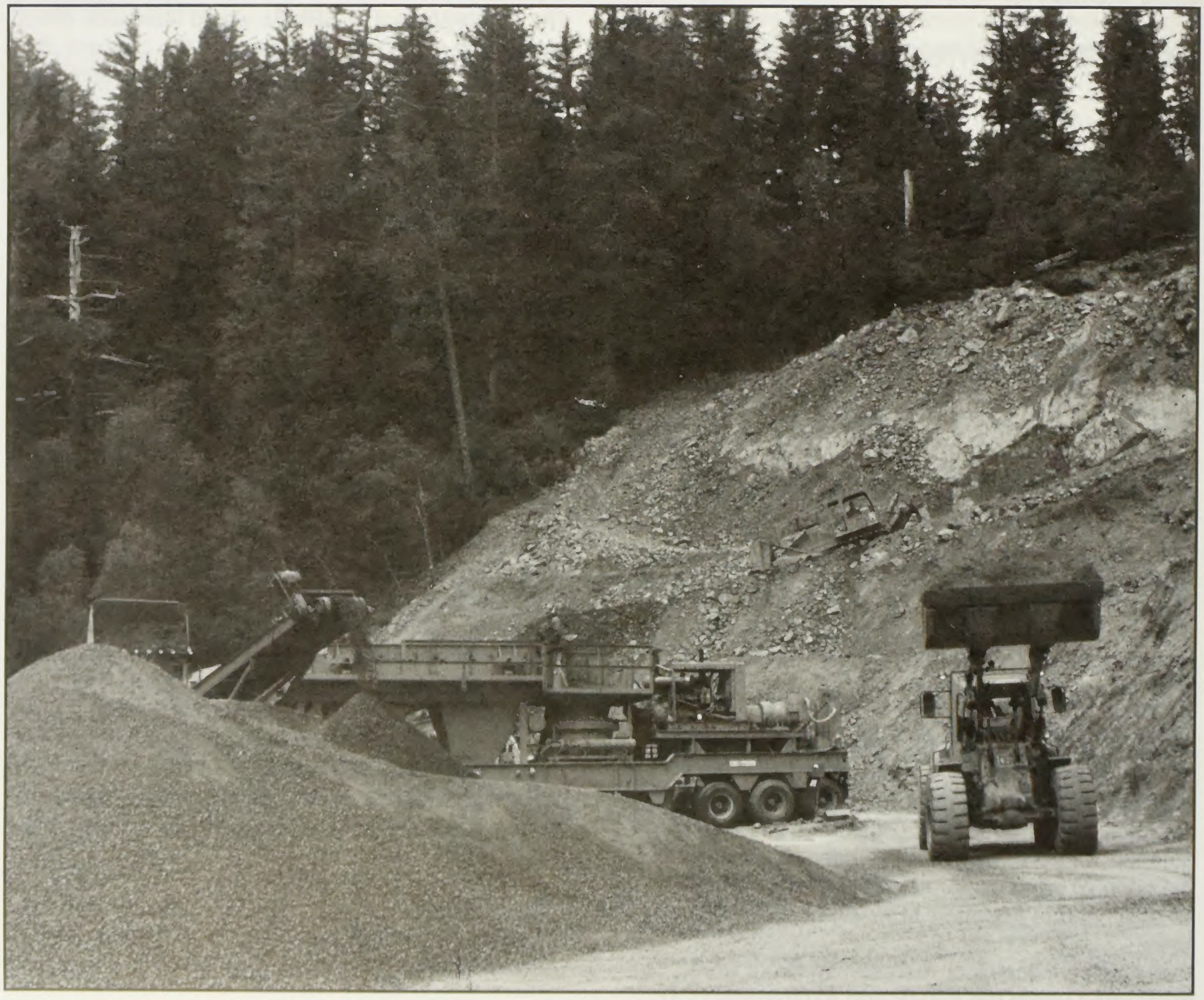

Table 4-33. Availability of Lands for Leasable Mineral Exploration and Development by Alternative

		Alternatives						
Restriction	Mineral Potential	PRMP	NA	A	B	C	D	E
Closed:								
Nondiscretionary	High	1,000	1,000	1,000	1,000	1,000	1,000	1,000
	Moderate	200	200	200	200	200	200	200
	Low	400	400	400	400	400	400	400
	Percent	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Open:								
No Surface Occupancy	High	102,200	1,300	2,500	4,400	5,900	8,300	15,400
	Moderate	25,600	300	600	1,100	1,500	2,100	3,800
	Low	42,500	500	1,000	1,800	2,500	3,400	6,400
	Percent	51.7	0.7	1.2	2.2	3.0	4.2	7.8
Standard Stipulations	High	60,800	192,500	190,900	186,300	178,700	167,000	142,600
	Moderate	15,200	48,000	47,600	46,500	44,600	41,600	35,500
	Low	25,400	80,100	79,400	77,500	74,400	69,500	59,400
	Percent	30.8	97.2	96.5	94.1	90.4	84.3	72.0
With Additional Restrictions	High	33,800	3,200	3,600	6,200	12,100	21,600	38,900
	Moderate	8,400	800	900	1,500	3,000	5,400	9,700
	Low	14,100	1,300	1,500	2,500	5,100	9,100	16,300
	Percent	17.0	1.6	1.8	3.2	6.1	11.0	19.7

Table 4-34 . Availability of Lands for Locatable Mineral Exploration and Development by Alternative

Restriction	Mineral Potential	PRMP	NA	A	B	C	D	E
		Alternatives						
Closed:								
Nondiscretionary	High	0	300	0	0	0	0	0
	Moderate	0	0	0	0	0	0	0
	Low	1,000	1,000	1,000	1,000	1,000	1,000	1,000
	Percent	0.3	0.4	0.3	0.3	0.3	0.3	0.3
Discretionary	High	300	1,600	1,600	1,600	1,600	1,600	1,600
	Moderate	800	1,400	1,400	1,400	1,400	1,400	1,400
	Low	10,400	2,800	2,800	5,100	9,200	9,200	9,200
	Percent	3.5	1.8	1.8	2.5	3.7	3.7	3.7
Open:								
Standard Requirements	High	3,000	9,400	9,500	9,400	9,100	8,900	8,900
	Moderate	7,000	21,900	22,300	21,900	21,300	20,700	20,900
	Low	89,500	282,500	287,000	281,900	273,800	267,400	268,900
	Percent	30.2	95.2	96.7	95.0	92.3	90.1	88.7
With Additional Restrictions	High	7,000	800	1,000	1,600	2,400	2,200	1,000
	Moderate	15,000	1,500	400	1,800	2,600	2,600	3,300
	Low	195,600	6,400	2,600	3,900	7,200	14,600	19,800
	Percent	66.0	2.6	1.2	2.2	3.7	5.9	7.3

Table 4-35. Availability of Lands for Salable Mineral Exploration and Development by Alternative

Restriction	Mineral Potential	PRMP	NA	A	B	C	D	E
			Alternatives					
Closed:								
Nondiscretionary	High	50	50	50	50	50	50	50
	Moderate	100	100	100	100	100	100	100
	Low	450	450	450	450	450	450	450
	Percent	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Discretionary	High	700	400	400	600	800	1,100	2,600
	Moderate	2,200	1,100	1,200	1,700	2,500	3,200	6,700
	Low	11,800	5,600	6,200	9,200	13,600	17,000	35,700
	Percent	4.4	2.2	2.4	3.5	5.1	6.5	13.6
Open:								
Standard Requirements	High	4,200	15,800	15,800	15,500	12,200	10,800	8,000
	Moderate	12,700	47,500	47,400	46,500	36,800	36,500	24,100
	Low	67,700	253,100	252,800	247,800	196,200	173,200	128,600
	Percent	25.8	95.9	95.8	94.0	74.4	65.6	48.7
With Additional Restrictions	High	11,500	300	200	300	3,400	4,600	6,200
	Moderate	34,500	800	800	1,200	10,000	13,700	18,600
	Low	183,700	4,400	4,200	6,200	53,000	72,900	98,900
	Percent	69.7	1.7	1.6	2.3	20.3	27.7	37.5

Effects on Socioeconomics

Introduction

Each alternative analyzed in this Final RMP/EIS proposes varying management prescriptions that would alter the production of commodity outputs and other natural resource values associated with BLM-administered lands. Alternatives NA and A through E have been carried forward from the Draft RMP/EIS and re-analyzed within the context of changed U.S. Forest Service (USFS) management direction specified in the *Final Supplemental Environmental Impact Statement (SEIS) on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* and decisions in the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (ROD). While the alternatives only represent actions which could occur on BLM-administered lands, many analytical components of the plan consider the relationship between BLM-administered lands and other federal, state, and private landowners. To estimate what future actions are likely to occur on USFS lands and to enhance the discussion of cumulative impacts, the economic analysis has drawn heavily upon the analyses conducted by the Forest Ecosystem Management Assessment Team in the *Forest Ecosystem Management: An Ecological, Economic, and Social Assessment Report of the Forest Ecosystem Management Assessment Team* (FEMAT) and the SEIS and decisions in the ROD.

No estimates have been made of the economic contributions to local personal income and employment that could be made by any potential developments such as mineral, energy, communication, and hydroelectric projects. The timing, duration, and degree of such developments are speculative and cannot be estimated at reasonably accurate levels given current information. Commercial fish production is also omitted from the projections of economic contribution, because its portion attributable to BLM-administered streams is not expected to change during the life of the plan. However, riparian and instream habitat should recover in the long term to provide habitat for potential optimum conditions for all salmonids, including commercial species. These habitat improvements should potentially produce an increase of fish over present levels, resulting in an increased economic contribution.

Effects on Resource Uses

The availability of commodities, natural resources, and opportunities would be altered by each alternative. Commodity uses generate measurable economic activity, both within and beyond the district. These activities include timber production and harvest, mining, recreation, and special forest products.

In addition to these activities, natural resources also have values that do not generate measurable economic activity within markets. These non-market values include: water quality and quantity, nature study and environmental education, cultural resources, scenic quality, threatened and endangered species habitat, and nongame wildlife habitat. These values are demonstrated by people who express a desire for these resources or opportunities to remain available on BLM-administered lands. These nonmarket values are to some extent reflected in changes in visitor use, but are not sufficiently quantifiable to be compared to other values in the socioeconomic analysis.

Timber

Timber markets within the Pacific Northwest region have undergone significant changes since the 1984-1988 baseline period. Two forces particularly relevant to federal timber supply and stumpage price are the curtailment of federal timber sales due to court injunctions and the adoption of the SEIS ROD by the Secretaries of Agriculture and the Interior—and accordingly the Forest Service and the BLM. Curtailment of federal timber sales within the range of the northern spotted owl resulted in forest industry reliance on sales remaining under contract for federal timber harvest since 1992. This volume is now essentially exhausted on the lands of both agencies.

The April 1994 SEIS ROD projected future timber harvest levels significantly lower than those identified in the Forest Service's forest plans and BLM's 1992 draft RMP/EISs in western Oregon. Any substantial change in timber supply could be expected to affect timber stumpage prices within the range of the northern spotted owl. The size of changes in federal timber harvests considered in the SEIS ROD was much larger than the changes in BLM harvests analyzed in this PRMP.

Future timber price projections were required in this PRMP to conduct portions of the analysis relating to employment, income, and county revenues. This PRMP assumes under all BLM alternatives that the

SEIS ROD is implemented on all of the affected National Forests. The result of this assumption is higher future stumpage price estimates than in the 1992 Draft RMP/EIS. For a complete description of the price estimation process, see Appendix IV-N, Timber Supply Analysis for BLM Planning, in the Draft RMP.

Multiple factors have combined to cause significant price changes since the baseline period. In general, the price variation among alternatives is expected to be minimal. The most significant change was between the baseline period and the 1993-2000 period. Examined alone, future variations in BLM timber harvest would have only marginal impacts on stumpage prices. Although price is one important market component that has changed, timber market structures are also undergoing change.

Alternatives C, D, E, and the PRMP reduce BLM timber harvest below historic levels. Reductions in BLM harvests—combined with reductions in Forest Service harvest levels—would reduce federal timber supplies in the Pacific Northwest. Although increased harvest levels on private land (industrial and non-industrial) would mitigate a portion of this reduction, an overall reduction in Northwest timber supply is expected. Analyses using the CINTRAFOR Global Trade Model indicate that reduced timber supply in the Pacific Northwest would be offset by a combination of reduced demand for wood products and additional supplies from other areas in the United States and other wood-producing countries of the global economy (Perez-Garcia 1991). Increased use of substitute or recycled materials—including plastics, aluminum, steel, and cement—would result in reduced demand for wood products and is expected to gain wider use, particularly in residential construction.

Use of substitute building materials and alternative timber resources has raised concerns about their environmental impacts. Questions have also been raised about the incremental impacts of local, regional, and national environmental policy choices on the global economy and environment (Lippke 1991, Schallau and Goetzl 1992).

Issues of concern that have been studied include the increased use of fossil fuels, CO_2 emissions, environmental impacts of increased mining and quarrying, and supply of wood products from less productive or less efficient producers. Use of these and other materials—instead of wood products—for similar uses in residential construction required more energy (as measured in oil equivalent BTUs) to produce and deliver (Koch 1991).

The rates at which reduced demand, substitute materials, and alternative supply sources would affect the wood products market are unknown. However, each replacement source can be expected to have associated economic and environmental impacts, often in other regions of the United States and the world.

Forest Production Activities

The structure of the forestry services sector would likely change under the direction established in the SEIS ROD as management emphasis shifts from timber production to ecosystem management. As fewer acres are subject to harvest, there would be a decrease in post-harvest reforestation, stand maintenance, and protection needs. Workers in these forest production activities, who are predominantly Hispanic, would likely have many of the skills needed to conduct the additional forest treatment, inventory, monitoring, and restoration activities envisioned in the forest management field described in the SEIS. It has been estimated that an additional 6,000 forestry services workers would be employed as a result of implementing the SEIS within the range of the northern spotted owl (BLM, USFS 1994). Many of these forestry service jobs, however, are low paying and cannot replace the wages associated with higher paying jobs associated with logging and millwork (Richardson 1993).

Recreation

Each alternative in the PRMP identifies management actions that would favor certain types of recreation, or constrain development of recreation sites and facilities. Alternatives NA, A, and B would be unable to meet demands for non-motorized travel, camping, other land-based recreation activities, and boating on BLM-administered lands (see the Recreation Section of Chapter 4). Alternative C would not meet the demand for camping and boating. Alternatives A and B would not meet the demands for other water-based use. Alternatives D and E would not meet visitor demands for motorized off-highway travel opportunities on BLM-managed lands due to road and Off-Highway Vehicle (OHV) closures. These unmet demands would be primarily due to constraints these alternatives place on development of trails, picnic areas, campsites and other facilities on BLM-administered lands. These constraints would change the amount of recreation-dependent personal income and employment attributable to BLM-administered lands in the district. However, substitution of recreation opportunities associated with other ownerships and areas within the Pacific

Northwest is expected to satisfy all demand for recreation activities.

Special Forest Products

Demand for most special forest products (SFPs) would probably be met under Alternatives NA, A, and B (see discussion of SFP demand in the Vegetation Section of Chapter 4). Lower fuelwood sales under Alternatives C, D, E, and the PRMP would result in lower federal permit receipts. Also, some individuals would be forced to purchase fuelwood from other sources at significant additional expense. Demand for other identified SFPs would most likely be met under these alternatives, depending on management objectives for other resources and sustainability of resource production.

Native Americans and non-native settlers have collected forest products for personal use for many years. Commercial collection has expanded as more products are marketed. The competition between local collectors and collectors from outside the region can sometimes generate conflict (Richardson 1993). Recent Asian and Hispanic immigrants have been identified as specific cultural groups entering the region specifically to collect SFPs. Anecdotal evidence suggests that unemployed wood products workers are also participating in commercial collection.

The permitted collection of SFPs under all alternatives may enhance local economies.

Effects on Personal Income and Employment

The BLMPACT model was used to analyze the employment and income associated with the use of timber, provision of recreation, and forest management within the Coos Bay District. Table 4-36 provides a summary of measurable outputs under each alternative in the district. These quantities represent values associated with BLM management actions under each alternative and were used to estimate dependent personal income and employment. Table 4-37 displays the varying levels of income and employment by sector associated with each alternative. Display of these impacts was changed from the Draft RMP/EIS in response to public comments. Impacts are now displayed by economic sector; employment and personal income associated with each resource commodity or activity are not shown. Non-market natural resource values were not included in the personal income and employment analyses.

Under all alternatives, reaching full implementation would take several years of increasing activities. This could prevent fully reaching the employment and income levels shown here for several years. The employment and income estimates for the PRMP do not include the effect of restoration activities. In the Coos Bay District, approximately 0.8 million cubic feet per year of timber might be removed from various reserves.

Under Alternatives NA, A, and B, total personal income would exceed income in the baseline period. Personal income calculated for the other alternatives would fall below the baseline. Employment would exceed the baseline under Alternatives NA, A, and B, and fall below the baseline under the other alternatives.

Cumulative Effects on Personal Income and Employment

An analysis was conducted to examine the effect of BLM management in all western Oregon districts on the western Oregon region. The common alternatives and the PRMPs from all six BLM districts in western Oregon were combined. The BLMPACT model was then used to estimate dependent personal income and employment. The analysis methodology paralleled that of the individual districts. It should be noted that, as a result of the economic interactions within the larger analysis area, the individual district results do not sum to the values calculated for western Oregon. Some areas have greater natural resource dependence with more direct effects, while other areas have greater economic diversity resulting in more indirect effects. Table 4-38 displays the results of the western Oregon cumulative analysis for the BLM alternatives.

The economic effects of the alternatives in western Oregon parallel those in the Coos Bay District. Income and employment would exceed the baseline under Alternatives NA, A, and B, and fall below the baseline in the other alternatives.

Management of BLM's timber resource is only one component of a larger economy. The SEIS examined the cumulative effects on timber industry employment of ten alternatives. SEIS Alternative 9, which was the basis for the SEIS ROD, is the focus of the following discussion.

The SEIS analysis of cumulative effects was conducted using regional coefficients representing timber industry employment affected per million board feet of timber harvest. Timber industry employment was defined as Solid Wood Products

Table 4-36. Summary of Measurable Annual Outputs by Alternative in the Coos Bay District

	Base	PRMP	NA	A	B	C	D	E
Timber Harvest (MMCF)	42.11	6.10	40.11	46.22	41.87	14.02	13.50	10.66
Non-Resident Recreational Use [1]								
Fishing (Angler Days)	26,100	37,160	37,160	37,160	37,160	37,160	37,160	37,160
Hunting (Hunter Days)	4,300	4,890	4,890	4,890	4,890	4,890	4,890	4,890
Non-Consumptive (User Days)	271,900	358,180	298,060	297,420	320,390	343,450	351,000	348,610
Timber Management Activity ($MM)	N/A	1.753	4.091	4.719	4.659	2.141	2.166	1.753

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[1] Hospodarsky, 1989. Pacific Northwest Outdoor Recreation Consumption Projection Study: Oregon Project Final Report.
Eixenburger, Don. Oregon State Parks. Personal Communications. July 23, 1991 and December 10, 1991.

Table 4-37. Estimated Dependent Personal Income and Employment by Sector and Alternative for the Coos Bay District

			Alternatives			
	1984-1988		PRMP		NA	
Personal Income, Millions (1989 Dollars)	Direct	Total	Direct	Total	Direct	Total
Total	23.613	47.519	6.120	11.512	24.092	48.151
Farm	0.005	0.034	0.007	0.026	0.006	0.044
Nonfarm	23.608	47.170	6.114	11.379	24.087	47.768
Ag. Serv., For., Fish., and Other	0.003	0.430	0.557	0.640	1.294	1.719
Mining	0.000	0.001	0.000	0.000	0.000	0.001
Construction	0.000	0.570	0.000	0.134	0.000	0.568
Manufacturing	21.871	34.966	3.267	5.248	20.850	33.365
Nondurable Goods	0.083	0.298	0.111	0.211	0.096	0.330
Paper & Allied Products	0.000	0.020	0.000	0.008	0.000	0.022
Durable Goods	21.788	34.668	3.156	5.037	20.753	33.036
Lumber & Wood Products	21.788	34.629	3.156	5.026	20.753	32.996
Transportation & Pub. Utilities	0.160	1.642	0.212	0.656	0.181	1.711
Wholesale Trade	0.037	0.081	0.049	0.065	0.041	0.088
Retail Trade	0.476	2.310	0.628	1.240	0.535	2.527
Finance, Insurance & Real Estate	0.000	0.999	0.000	0.322	0.000	1.072
Services	1.060	6.172	1.400	3.075	1.185	6.716
Government	0.000	0.315	0.000	0.106	0.000	0.339
Federal, Civilian	0.000	0.226	0.000	0.078	0.000	0.244
State and Local	0.000	0.088	0.000	0.028	0.000	0.095

	1984-1988		PRMP		NA	
Employment (Jobs)	Direct	Total	Direct	Total	Direct	Total
Total	1,169	2,294	466	774	1,354	2,499
Farm	1	7	1	5	1	9
Nonfarm	1,168	2,271	464	763	1,352	2,473
Ag. Serv., For., Fish., and Other	0	54	78	88	182	236
Mining	0	0	0	0	0	0
Construction	0	20	0	5	0	20
Manufacturing	989	1,302	150	200	970	1,243
Nondurable Goods	6	18	8	13	7	20
Paper & Allied Products	0	0	0	0	0	0
Durable Goods	983	1,284	142	187	964	1,224
Lumber & Wood Products	983	1,282	142	186	964	1,222
Transportation & Pub. Utilities	8	76	11	31	9	79
Wholesale Trade	2	14	2	5	2	14
Retail Trade	41	188	54	103	46	206
Finance, Insurance & Real Estate	0	69	0	23	0	75
Services	128	549	169	308	143	599
Government	0	16	0	5	0	17
Federal, Civilian	0	8	0	3	0	9
State and Local	0	7	0	2	0	8

Source: USDI, BLM 1989b

Alternatives									
A		B		C		D		E	
Direct	Total	Direct	Total	Direct	Total	Direct	Total	Direct	Total
27.442	54.957	25.316	50.565	10.252	19.946	10.036	19.489	8.422	16.228
0.000	0.049	0.006	0.048	0.006	0.030	0.006	0.030	0.006	0.028
27.442	54.525	25.310	50.159	10.245	19.757	10.029	19.301	8.415	16.065
1.492	1.980	1.473	1.919	0.680	0.841	0.687	0.844	0.557	0.684
0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.649	0.000	0.596	0.000	0.234	0.000	0.229	0.000	0.190
24.011	38.423	21.766	34.835	7.361	11.794	7.094	11.368	5.624	9.015
0.096	0.356	0.102	0.348	0.107	0.237	0.109	0.239	0.109	0.225
0.000	0.024	0.000	0.023	0.000	0.011	0.000	0.011	0.000	0.010
23.915	38.067	21.664	34.487	7.254	11.557	6.985	11.129	5.516	8.790
23.915	38.021	21.664	34.444	7.254	11.539	6.985	11.112	5.516	8.775
0.181	1.916	0.193	1.803	0.205	0.897	0.209	0.889	0.207	0.789
0.041	0.094	0.044	0.093	0.047	0.070	0.048	0.071	0.048	0.068
0.534	2.792	0.570	2.674	0.605	1.530	0.617	1.528	0.613	1.393
0.000	1.216	0.000	1.132	0.000	0.492	0.000	0.485	0.000	0.414
1.183	7.454	1.265	7.106	1.347	3.898	1.374	3.887	1.366	3.512
0.000	0.384	0.000	0.358	0.000	0.159	0.000	0.157	0.000	0.135
0.000	0.276	0.000	0.257	0.000	0.116	0.000	0.114	0.000	0.098
0.000	0.108	0.000	0.100	0.000	0.044	0.000	0.043	0.000	0.037

A		B		C		D		E	
Direct	Total	Direct	Total	Direct	Total	Direct	Total	Direct	Total
1,497	2,832	1,407	2,641	659	1,165	652	1,148	566	983
1	10	1	10	1	6	1	6	1	6
1,495	2,802	1,406	2,613	657	1,151	651	1,134	565	971
210	272	208	264	96	116	97	116	78	94
0	0	0	0	0	0	0	0	0	0
0	23	0	21	0	8	0	8	0	7
1,086	1,431	985	1,298	335	443	323	427	256	340
7	21	7	21	7	15	7	15	7	14
0	0	0	0	0	0	0	0	0	0
1,079	1,410	978	1,277	327	428	315	412	249	326
1,079	1,408	978	1,275	327	427	315	411	249	325
9	88	10	83	11	42	11	41	11	37
2	16	2	15	2	7	2	7	2	6
46	227	49	218	52	126	53	126	53	115
0	85	0	79	0	35	0	35	0	30
143	660	153	635	163	374	166	374	165	342
0	19	0	18	0	8	0	8	0	7
0	10	0	10	0	4	0	4	0	4
0	9	0	8	0	4	0	4	0	3

Table 4-38. Estimated Dependent Personal Income and Employment by Alternative, Western Oregon BLM

			Alternatives			
	1984-1988		PRMP		NA	
Personal Income, Millions (1989 Dollars)	Direct	Total	Direct	Total	Direct	Total
Total	111.057	254.892	29.974	65.915	112.261	257.286
Farm	0.088	0.284	0.088	0.214	0.088	0.356
Nonfarm	110.969	252.980	29.887	65.179	112.173	255.202
Ag. Serv., For., Fish., And Other	0.010	5.191	2.814	3.824	6.538	11.515
Mining	0.000	0.017	0.000	0.005	0.000	0.017
Construction	0.000	3.575	0.000	0.830	0.000	3.499
Manufacturing	104.873	173.346	18.936	32.207	99.001	164.433
Nondurable Goods	0.294	4.861	0.392	2.073	0.325	5.259
Paper & Allied Products	0.000	0.566	0.000	0.220	0.000	0.620
Durable Goods	104.579	168.485	18.544	30.134	98.675	159.173
Lumber & Wood Products	104.579	165.154	18.544	29.309	98.675	155.855
Transportation & Pub. Utilities	0.622	12.587	0.830	4.233	0.681	12.971
Wholesale Trade	0.127	0.771	0.170	0.401	0.139	0.807
Retail Trade	1.665	9.742	2.218	4.791	1.819	10.544
Finance, Insurance & Real Estate	0.000	11.073	0.000	3.496	0.000	11.843
Services	3.672	36.678	4.919	15.392	3.996	39.573
Government	0.000	1.628	0.000	0.522	0.000	1.729
Federal, Civilian	0.000	1.183	0.000	0.387	0.000	1.259
State and Local	0.000	0.445	0.000	0.135	0.000	0.470

	1984-1988		PRMP		NA	
Employment (Jobs)	Direct	Total	Direct	Total	Direct	Total
Total	5,299	12,204	2,048	3,930	6,107	13,236
Farm	15	58	15	42	15	72
Nonfarm	5,285	12,068	2,033	3,863	6,093	13,081
Ag. Serv., For., Fish., and Other	0	756	440	586	1,024	1,751
Mining	0	1	0	0	0	1
Construction	0	132	0	31	0	130
Manufacturing	4,734	6,574	856	1,237	4,469	6,247
Nondurable Goods	15	224	19	100	16	247
Paper & Allied Products	0	24	0	9	0	26
Durable Goods	4,719	6,350	837	1,137	4,453	6,000
Lumber & Wood Products	4,719	6,186	837	1,098	4,453	5,838
Transportation & Pub. Utilities	23	463	31	155	26	477
Wholesale Trade	5	145	7	42	6	146
Retail Trade	132	753	176	373	144	815
Finance, Insurance & Real Estate	0	601	0	193	0	646
Services	391	2,643	524	1,247	425	2,871
Government	0	78	0	25	0	83
Federal, Civilian	0	44	0	14	0	47
State and Local	0	34	0	10	0	36

Source: USDI,BLM 1989b

Alternatives

A		B		C		D		E	
Direct	Total	Direct	Total	Direct	Total	Direct	Total	Direct	Total
145.002	333.352	131.645	302.220	47.819	107.514	51.501	115.954	39.842	88.756
0.105	0.436	0.091	0.394	0.084	0.249	0.079	0.241	0.069	0.200
144.896	330.702	131.555	299.811	47.735	106.471	51.422	114.874	39.773	87.901
8.230	14.767	7.410	13.306	4.665	6.509	3.935	5.976	2.316	3.825
0.000	0.022	0.000	0.020	0.000	0.007	0.000	0.008	0.000	0.006
0.000	4.555	0.000	4.123	0.000	1.395	0.000	1.525	0.000	1.162
130.380	216.310	117.517	195.043	35.538	59.720	39.734	66.569	29.295	49.217
0.309	6.563	0.323	6.041	0.365	2.785	0.375	2.912	0.392	2.425
0.000	0.783	0.000	0.717	0.000	0.311	0.000	0.325	0.000	0.262
130.072	209.746	117.193	189.003	35.174	56.935	39.359	63.658	28.903	46.792
130.072	205.439	117.193	185.100	35.174	55.574	39.359	62.182	28.903	45.664
0.646	16.486	0.679	15.068	0.770	6.126	0.792	6.522	0.832	5.271
0.132	0.977	0.139	0.913	0.157	0.483	0.162	0.507	0.170	0.453
1.726	12.926	1.816	11.999	2.057	6.046	2.116	6.310	2.224	5.458
0.000	15.202	0.000	13.822	0.000	5.398	0.000	5.690	0.000	4.403
3.783	49.458	3.994	45.518	4.548	20.786	4.683	21.766	4.936	18.107
0.000	2.214	0.000	2.015	0.000	0.794	0.000	0.839	0.000	0.656
0.000	1.610	0.000	1.466	0.000	0.583	0.000	0.616	0.000	0.483
0.000	0.604	0.000	0.549	0.000	0.211	0.000	0.223	0.000	0.172

A		B		C		D		E	
Direct	Total	Direct	Total	Direct	Total	Direct	Total	Direct	Total
7,760	16,982	7,080	15,442	3,031	6,078	3,126	6,382	2,437	4,920
17	89	15	81	14	50	13	48	12	40
7,742	16,788	7,065	15,265	3,017	5,991	3,112	6,294	2,425	4,849
1,289	2,245	1,161	2,022	730	998	616	913	362	580
0	1	0	1	0	0	0	0	0	0
0	169	0	153	0	52	0	56	0	43
5,885	8,213	5,304	7,407	1,605	2,280	1,795	2,539	1,324	1,880
15	307	16	283	18	133	19	138	19	115
0	32	0	30	0	13	0	13	0	11
5,869	7,906	5,288	7,124	1,587	2,147	1,776	2,401	1,304	1,765
5,869	7,695	5,288	6,934	1,587	2,082	1,776	2,329	1,304	1,711
24	606	25	554	29	225	30	240	31	194
5	188	6	171	6	64	6	69	7	54
137	997	144	926	163	469	168	490	176	425
0	828	0	753	0	296	0	312	0	242
402	3,541	425	3,279	484	1,606	499	1,676	526	1,432
0	106	0	97	0	38	0	40	0	31
0	60	0	54	0	22	0	23	0	18
0	47	0	43	0	16	0	17	0	13

plus Pulp and Paper. Self-employment, wage, and salary employment was included.

Within Oregon, subregional differences were identified. Employment in Solid Wood Products was similar for all regions except the central region (Deschutes, Klamath, Lake, Jefferson, and Wasco counties). In the central region, approximately 16 jobs per million board feet are affected. For the remaining subregions, approximately nine jobs per million board feet are affected. The northwest region (Clackamas, Clatsop, Columbia, Hood River, Marion, Multnomah, Polk, Tillamook, Washington, and Yamhill counties) was identified as having significant Pulp and Paper employment (2.19 jobs per million board feet). The remaining subregions have limited Pulp and Paper employment per million board feet.

Overall, timber industry employment in western Oregon is projected to decline 23 percent from 1990 levels under the SEIS ROD. A 40 percent reduction from the 1990 timber industry employment level is projected for the southwest subregion. A decline of 28 percent is projected for the west-central subregion (Benton, Lane, Lincoln and Linn counties). The northwest and central regions are both projected to experience less than 10 percent reductions in timber industry employment from the 1990 level.

Effects on County Revenues

Future prices for timber stumpage in the Pacific Northwest are a key determinant of future revenue effects. O&C payments to counties, severance taxes, and federal treasury receipts are all affected by the level of BLM timber harvest, with the price of timber determined by a competitive bid process. Pacific Northwest timber prices are expected to increase from the baseline period as supplies from federal lands decrease.

Table 4-39 displays the projected prices and harvest levels by alternative together with the estimated O&C payments to each county.

Prices under all alternatives are projected to increase significantly from the baseline period due to external factors beyond the scope of BLM's management alternatives (such as reduced harvest on National Forest lands within the northern spotted owl region). The analysis assumes all BLM districts would adopt the same alternative. Under Alternatives A and B, which increase harvest levels relative to those of the baseline period, county O&C revenues would increase significantly over those of the baseline period. This is partly because external factors would cause timber prices to be higher than those of the baseline period. Under Alternatives C, D, E, and the PRMP, increased stumpage prices would not fully mitigate timber harvest reductions, because O&C payments to counties would be reduced below those during the baseline period. In recent years, legislation has provided for additional safety net payments to the counties. As an example, in fiscal year 1991, payment of 96 million dollars was guaranteed. This amount represents 152 percent of the average payment during the baseline period. Current legislation specifies a gradual ramping down of the guaranteed payment level from the 1986-1990 average payment. These safety net payments have mitigated a large portion of county revenue impacts of reduced BLM harvest under the recent court injunctions. Because the safety net provision is subject to Congressional revision, Table 4-39 does not incorporate this legislation into the estimates displayed.

Payments in Lieu of Taxes (PILT), which are made for a variety of federal lands within each county, are projected to remain unchanged under all alternatives. Potential changes in land tenure by the BLM and other federal agencies could alter the level of payment made to the county. County revenue impacts of specific exchanges or disposals are not included in this document, but are evaluated as they are proposed.

Coos Bay Wagon Road (CBWR) payments to local taxing districts would decline from the baseline period and the NA Alternative under Alternatives C, D, E, and the PRMP. The Port of Coquille and School District No. 41 would be particularly impacted because historically they have each received approximately 10 percent of their funding from this source.

Approximately five percent of the revenues generated by public domain (PD) lands are dispersed through the state to counties proportionate to the land area within the county. Historically, timber harvest has been the dominant source of revenue from these lands. Based on estimated PSQs, revenues of Alternatives A, B and NA would increase. Under Alternatives C, D, E, and the PRMP, revenues would be reduced. The counties must use these revenues to build roads, bridges, and other capital improvements. Funding for these projects would be reduced by Alternatives C, D, E, and the PRMP. There will, however, be some future opportunities to increase revenue collections for use of PD lands. For example, collections could increase for permits associated with special forest products and special recreation if these two programs expand.

Table 4-39. Projected O&C Payments to Counties Attributable to Timber Harvest in Western Oregon (thousands of constant dollars)

	1984-1988 Average	PRMP	NA	A	B	C	D	E
Benton	$1,770	$724	$3,652	$4,761	$4,333	$1,352	$1,521	$1,115
Clackamas	$3,478	$1,430	$7,213	$9,403	$8,558	$2,670	$3,005	$2,203
Columbia	$1,302	$531	$2,677	$3,490	$3,176	$991	$1,115	$818
Coos	$4,148	$1,520	$7,668	$9,996	$9,097	$2,838	$3,195	$2,342
Curry	$2,290	$941	$4,743	$6,184	$5,628	$1,756	$1,976	$1,449
Douglas	$15,850	$6,456	$32,555	$42,439	$38,625	$12,051	$13,563	$9,943
Jackson	$9,828	$4,038	$20,364	$26,548	$24,162	$7,538	$8,485	$6,220
Josephine	$7,579	$3,113	$15,699	$20,466	$18,626	$5,811	$6,541	$4,795
Klamath	$1,464	$603	$3,041	$3,964	$3,608	$1,126	$1,267	$929
Lane	$9,627	$3,935	$19,845	$25,870	$23,545	$7,346	$8,268	$6,061
Lincoln	$234	$93	$468	$610	$555	$173	$195	$143
Linn	$1,669	$680	$3,431	$4,473	$4,071	$1,270	$1,429	$1,048
Marion	$919	$376	$1,897	$2,474	$2,251	$702	$791	$580
Multnomah	$685	$281	$1,417	$1,847	$1,681	$524	$590	$433
Polk	$1,359	$557	$2,807	$3,659	$3,331	$1,039	$1,170	$857
Tillamook	$355	$144	$728	$949	$863	$269	$303	$222
Washington	$398	$162	$819	$1,067	$971	$303	$341	$250
Yamhill	$460	$186	$936	$1,220	$1,110	$346	$390	$286
Total	**$63,415**	**$25,771**	**$129,958**	**$169,418**	**$154,190**	**$48,107**	**$54,145**	**$39,693**
Assumed Price [1]	$707	$1,692	$1,608	$1,576	$1,589	$1,674	$1,667	$1,680
Total Volume (MMCF)		36	191	251	227	68	76	56
O&C Volume (MMCF)		30	162	215	194	57	65	47

[1] Prices estimated based on an index of 1982 constant dollars scaled to the 1984-88 actual average price of $707.34.

Under Alternatives NA, C, D, E, and the PRMP, harvest volumes subject to state Forest Products Harvest Tax would decline from baseline levels. Given constant tax rates, revenues could be expected to decline under these alternatives. Decreases in revenues would negatively impact programs funded by this tax, such as forest research and fire prevention or suppression. The Oregon State Legislature sets the tax rate and in recent bienniums has significantly increased the tax rate, as well as a number of programs funded by the tax. In future sessions, the legislature could increase the tax rate to maintain constant revenue streams despite decreased harvest volumes.

Cumulative Effects on County Revenue

After examining the impacts of reduced timber harvest on both BLM and Forest Service lands, the SEIS concluded that anticipated timber price increases would not fully offset the revenue declines to the federal and local governments from implementation of the SEIS alternatives. Like the analysis displayed in Table 4-39, the historical distribution formula of O&C payments was used. The current Congressional safety net was not included.

Several state and county issues would make it difficult for counties to replace federal timber revenues. Among the issues are passage of Ballot Measure 5 Property Tax Limitation and a general anti-tax sentiment among voters as demonstrated by the defeat of several sales tax initiatives. Interviewed individuals and county officials in rural counties expressed concern about this decreasing tax base (Richardson 1993).

Effects on Community Structure and Attributes

Recent discussions of community stability by natural resource sociologists have identified three broad definitions for human communities—a geographic area, local social systems, and types of relationships. Examples of these communities include town, county or state boundaries, commuting area, or relationships such as occupation or religious affiliation.

Community stability is an often stated desire of all types of communities. Stability is a misnomer, however, since communities are in a constant state of transition and the status quo is rarely maintained. Attributes of prosperity, adaptability, cohesiveness, and ability to absorb and cope with change have been identified as desirable by some definitions of community stability (Society of American Foresters 1989). These definitions recognize change and seek orderly change as a desired goal.

Many geographic, social, or relational factors affect the above-listed desired attributes of any community. These factors include economic diversity, economic stability, population stability, social cohesion or community solidarity, structural diversity, location, quality of life, human capital, size, and local leadership (BLM, USFS 1994). In the Pacific Northwest, timber or forest dependence has been identified as a destabilizing factor due to recent changes in forest management (BLM, USFS 1994).

The FEMAT report and the SEIS identify attributes of communities likely to experience economic and social impacts that disrupt existing community structures and trends. Communities with these attributes were labeled "most at risk." Specifically, the SEIS text (page 2-82) states:

> The "most at risk" communities differ from others in significant ways. These communities are smaller (average population 3,000), and they are located in counties with low population density. Isolated communities are more likely to experience negative consequences... because they have fewer employment options available locally or in nearby communities, and because of limited access to capital, transportation links, and other resources. Communities that are small, isolated, and lacking in economic diversity are more likely to be "at risk" than others. These communities may find it difficult to mobilize and respond to changing conditions that may affect a variety of groups. These communities are likely to experience unemployment, increased poverty, and social disruption in the absence of assistance.

A study of the socioeconomic effects of BLM's resource management plans in western Oregon was conducted by the Institute for Resources in Society, University of Washington (Richardson 1993). A major part of the study was to determine who is affected by agency actions and how they are affected. Richardson obtained information through interviews with BLM employees and several people in each district who were familiar with the BLM and the area. These individuals were selected by district employees and often had worked with the BLM citizen advisory council in the district. They included local bank officers; tribal representatives; city, county and state officials; social service and development administrators; timber interests; and environmental professionals.

The following discussion of the socioeconomic effects of BLM management within the district includes information from a variety of sources but relies heavily on the research done by Richardson. A copy of the full report is available for review at the district office.

While the questions about who is affected and how they are affected are simple, the answers must consider many interacting social and economic processes. Fundamentally, the answers must also consider people's relationships with self, one another, BLM, other institutions, and the environment. People who are affected by BLM management in the district include:

- People who directly use the lands.
- People who use natural resources that are affected by management of the lands (e.g., timber, fish, and water).
- People who care about management of the lands.

Given global trade in forest products and the national and international interest in northwest forest management in recent years, people across the nation and the globe are affected by BLM management.

In general, local residents receive the greatest quantity of tangible and intangible benefits from BLM-administered lands. Accordingly, local residents are most likely to be strongly affected—positively and negatively—by changes in BLM resource management activities. The direction and intensity of the effects will vary with individuals' personal uses and values for the lands.

People are affected in many aspects of their lives—as workers, members of families and communities, and consumers; and in their relationships with other people and the environment. The effects of BLM management on people occur in the context of existing socioeconomic processes. The BLM has little control over many of these processes, but these processes can both magnify and reduce the intensity of the BLM's socioeconomic effects.

Timber industry impacts are estimated to vary substantially by subregion and BLM district. The Coos Bay District is included within the southwest region, which is identified as having the greatest potential for job displacement in the timber industry and the fewest opportunities for alternative employment. This region is also confronted with employment losses in the commercial fishing industries (Phillips 1994). People interviewed in the Coos Bay District compared the social impacts of current job losses in the lumber and wood product industry to the early 1980s. Similar increases in drug and alcohol abuse, marital problems, family violence, crime and depression are expected (Richardson 1993). In addition, the income and employment in fishing and seafood processing have suffered from competition of other fisheries and restrictions on harvests in recent years. This trend is expected to continue (Oregon Employment Division 1992).

In Curry County, the most economic growth has been in the trade, services, and construction sectors (Oregon Employment Division 1992). People interviewed in Coos Bay considered employment opportunities in the area to be poor. The new stores and restaurants that are opening are thought to offer little more than minimum wage. People employed in the trade and service sectors are reportedly working two or three jobs to earn sufficient income to meet their needs (Richardson 1993).

Economic development strategies in the area have focused on tourism as a primary growth strategy, together with light industry and cottage businesses, and ongoing efforts for port development.

People interviewed in the Coos Bay area by Richardson were concerned that the BLM's timber harvest reductions could contribute to increasing public demand for similar reductions in Coos County and state-owned forests, which would further reduce county revenues in western Oregon. Particular concern was expressed for local school funding (Richardson 1993).

Because a person's work can provide both income and an important source of identity, the loss of employment can bring economic and psychological hardship to individuals, their families, and their communities. Unemployment in the Oregon timber and wood products industries in the 1980s and 1990s has had these effects. The timber harvest levels proposed in the PRMP will support lower levels of employment in the wood products industry than were supported by harvests in the 1980s.

The causes of job losses in the wood products industry over the past decade are multiple, and include recessions in the early 1980s and 1990s, changes in worker productivity, and court injunctions on timber sales from federal lands. Although workers in the industry have adapted to fluctuating employment caused by economic and business cycles, job losses caused by changing federal policies appear to be permanent, rather than temporary in nature. For people who do not believe that reductions in federal harvest levels are warranted, current and projected unemployment in the wood products industry is a source of great distress.

The interacting factors that are contributing to job losses in the wood products industry make it difficult to measure the specific effects of BLM management. However, the high visibility of changes in federal forest management compared with these other factors lead many people to attribute unemployment in the wood products industry solely to BLM and Forest Service harvest levels.

Despite the common focus on timber in discussions of federal forests, the BLM contributes to employment and income in the district in many ways. Environmental quality is vital to many aspects of Oregon's economy (including tourism, commercial fishing and seafood processing) and the ability to attract new business and good workers. Retirees moving to Oregon also contribute to local economies. As the BLM contributes to improvements in environmental quality, it will be contributing to the growth of these economic sectors in the state and in local communities.

The BLM provides economically valuable infrastructure—such as roads, utility corridors, communication sites, and water supplies—for people throughout the district. Water quality is predicted to improve under the PRMP.

Special forest products are rapidly increasing in economic importance. Much information about the scale, environmental effects, and economic value of collections remains anecdotal. The probable effects of the PRMP on special forest products collectors is unclear, but BLM managers anticipate increasing regulation in coming year.

Many timber-producing areas in the district are actively seeking diversity for their economies, often focusing on tourism and retirement services. However, average wages in retail trade and services, which are the fastest growing economic sectors in the state, are much lower than wages in the timber industry. For Oregon, in 1990 the average annual wage was $25,104 in lumber and wood products manufacturing, $18,757 in services, and $12,594 in retail trade.

Within the Coos Bay District, BLM and Forest Service receipts are important to Coos and Curry counties. In 1991, Coos County was even more dependent on revenues from BLM-administered lands, which were equivalent to 28 percent of county expenditures. Curry County, which has been highly dependent on federal forest revenues in recent years, received almost half of its public forest revenues from the BLM in 1991 (Richardson 1993).

Revenues from BLM timber sales have historically provided most payments to counties, but Congress has provided safety net payments during the 1990s as court injunctions have restricted the sale of timber from BLM-administered lands. The effects of BLM management on county revenues will depend on whether the federal government chooses to continue safety net payments.

If county revenues drop, the poor and unemployed will suffer most as services they use are cut back or eliminated. All county residents may be affected to some extent if there are reductions in law enforcement and emergency services, parks and libraries, and maintenance of roads and other infrastructures. Meanwhile—due to unemployment in the timber industry—communities anticipate increasing demand for many of the services that may be cut.

Ballot Measure 5 and shrinking tax bases in some communities constrain local government's abilities to raise revenues from other sources. National Forest payments to counties may also decline, depending on federal decisions. Ballot Measure 5 and declining National Forest payments particularly affect education, and many people are concerned about the long-term social and economic effects of a poorly funded educational system. Combined with reductions in other local services and infrastructure, these changes could negatively affect communities' economic development efforts by making them less attractive to new businesses and retirees.

Unemployment has been linked with increases in drug and alcohol abuse, domestic violence, and stress-related physical and mental health problems, among other negative consequences. As wood products jobs have declined in many rural communities over the past 13 years, many workers have left those communities, stretching or breaking ties with family and friends who remained. At the same time, many of these same rural areas have been experiencing influxes of retirees and other new migrants, who have brought new ideas and expectations for forest management with them.

Many traditionally timber-producing families and communities feel their way of life and many of their basic values are threatened by changes that have been occurring, and by their perceptions of negative stereotypes of loggers and millworkers in the media. The PRMP compounds these perceptions for many who are already greatly distressed by projecting increased unemployment.

For some rural and urban residents of the district, the PRMP plan is a step in the right direction, but does not go far enough to protect the environment and to remedy perceived environmental damage from past management practices. People who have moved to rural areas in search of a pleasant, healthful place to retire or raise a family are especially concerned about the environmental effects of BLM practices such as clearcutting, herbicide use, and prescribed burning.

People on all sides of resource management issues in the district care deeply about forests and the natural environment, but different ideas exist about how to best express that care. For example—while the PRMP would benefit people whose aesthetic, cultural, and spiritual values are fulfilled by environmental preservation and some forms of recreation—it would provide low recognition for people who express personal values and find meaning through working the land. The PRMP provides more opportunities for preservation and recreation uses and fewer opportunities for timber management. In summary, some people would gain in the quality of their relationships with the natural world; others would lose.

Effects on Rural Interface Areas

Resource management activities (such as road construction, timber harvest, forest management activities, and minerals development) can create adverse impacts on neighbors living in rural interface areas (see Rural Interface Areas section and Map 3-12). The reactions of neighboring landowners to these activities can create opportunity costs (e.g., decisions to defer or not harvest timber) or additional expense for BLM resource management in RIAs. In some situations, the number of neighbors and resource management activities are directly proportional to the number of conflicts and the additional costs to BLM.

Table 4-40 depicts the potential for concern during the first decade. This table displays estimated harvest acres within RIAs for the next decade based on the 10-year timber management scenario. Harvest acres within RIAs decrease significantly as acreage allocated to other resources increase and the acreage allocated to intensive management is reduced.

Alternative A, which provides the highest level of timber harvest and road construction in RIAs, would have the most impact on RIAs. Other management actions besides the timber harvest level that would attribute to this alternative's high impact level include the absence of special timber management actions or mitigation measures and the minimal constraints on potential minerals development. The potential for conflicts under Alternative A is moderate in the 1- to 5-acre and minimal in the 6- to 20-acre categories (see Table 4-40).

Alternative B provides a high level of timber harvest in RIAs. However, the impact of this alternative would be less than Alternative A due to using special timber harvest mitigation measures, where realistically feasible, within 0.25 mile of 1- to 5-acre zoned areas. Although Alternative B allows future oil and gas development within 0.25 mile of RIAs, the activity would be constrained by the no surface occupancy restriction. As shown in Table 4-40, the potential for conflicts is moderate in the 1- to 5-acre categories and minimal in the 6- to 20-acre categories. Many of the potential RIA concerns not addressed in Alternative A could be mitigated under Alternative B.

Alternative C would have a low impact on RIAs due to its low level of timber harvest in RIAs and special timber harvest mitigation measures within 0.25 mile of 1- to 20-acre zoned areas. Although Alternative C allows future oil and gas development within 0.25 mile of RIAs, the activity would be constrained by the no surface occupancy restriction. As shown in Table 4-40, the potential for conflicts is lower than Alternatives A and B since the harvested acres are

Table 4-40. Acres of Potential Concern in Rural Interface Areas

RIA Categories	PRMP	NA [1]	A	B	C	D	E
0.25-mile of 1- to 5-acre zoned areas	0	300	320	300	200	100	80
0.5-mile of 1- to 5-acre zoned areas	0	1,000	1,070	1,000	650	300	240
0.25-mile of 6- to 20-acre zoned areas	0	0	0	0	0	0	30
0.5-mile of 6- to 20-acre zoned areas	0	0	0	0	0	0	30

[1] Estimate based on comparison of ASQ with other alternatives.

reduced by about 30 percent. Another action that would limit impacts on acres harvested under Alternative C is the requirement for retention of leave trees amounting to about 40 percent of the basal area in most areas, and 17.5 percent of the basal area in the remaining areas. Other management actions that would minimize impacts under Alternative C include: limiting of clearcutting to small patches; significant reduction in use of intensive management practices such as aerial applications of herbicides or fertilizer; and wider stream buffers than Alternatives A and B. Although Alternative C does not address all RIA concerns, its combination of reduced acres harvested during the next decade and modified management practices should minimize conflicts with neighbors.

Alternative D also would have few impacts on RIAs due to its low level of timber harvest in RIAs and special timber harvest constraints within 0.25 mile of 1- to 20-acre zoned areas. Although Alternative D allows future oil and gas development within 0.25 mile of RIAs, the activity would be constrained by the no surface occupancy restriction. As shown in Table 4-40, the potential for conflicts is low in both the 1- to 5-acre and the 6- to 20-acre categories. Actions under Alternative D that would minimize RIA impacts include: prohibiting the use of herbicides, prescribed burning, and clearcut harvesting; and prescribing wider Riparian Management Areas (RMAs). With about 50 percent less harvested acres than Alternative C and very restricted management on RIA acres, Alternative D should have minimal impacts on neighbors.

Under Alternative E, potential conflicts in all RIA categories would be low due to constraints on timber harvesting (no clearcutting, no prescribed burning, no herbicide spraying, and wide riparian buffers) and minerals development (no surface occupancy restriction).

The No Action (NA) Alternative would have impacts very similar to Alternative A, since neither has any constraints on intensively-managed lands specific to rural interface areas.

Impacts on RIAs under the Proposed Resource Management Plan (PRMP) would be minimal as the RIAs are allocated for other resource use, and only limited selective thinning would occur.

The "no burning" criterion under Alternatives D and E could lead to increased fire hazard situations in rural interface areas. If heavy logging slash or slashed vegetation is left in units, a wildfire could quickly spread through the units, making it difficult to protect nearby homes and other improvements from damage or destruction. Although mitigation measures are possible (e.g., mechanical removal or chipping of slash and cutting of understory vegetation), the fire hazard would remain higher than normal for several decades after logging. This increased fire danger could be critical considering the potential risk of RIA occupied lands to impact adjacent BLM-administered lands.

The increased use of helicopter logging envisioned in Alternatives C, E, and the PRMP would have an increased noise impact on residents living in the rural interface. These impacts would occur during daylight operating hours. The frequency could vary from as few as 2, to as many as 150 or more, passes per day. Previous experience indicates that rural interface residents are most often affected in the early morning and late evening hours. In many cases, noise from the helicopter is audible most of the day, with the greatest amount of noise audible when the helicopter is within 500 feet. The noise could strain family relationships and disturb domestic livestock. Possible helicopter logging restrictions (such as restricting hours of operation, location of landings, and flight paths) could reduce, but not eliminate, noise-associated effects. The noise of helicopter logging is an unavoidable adverse effect resulting from the increased use of helicopter logging required to implement the PRMP. This adverse impact would also be more pronounced if the population of the rural interface continues to increase.

Effects on Wildfire

Factors Affecting Wildfire Potential

The intensity and size of any wildfire depends largely on the local weather at the time of and following ignition, long term and seasonal climatic patterns, amount and distribution of available fuel, the slope and aspect of the landscape on which the fire is burning, the availability of suppression forces, and the amount of time it takes to reach the wildfire and take suppression actions. Except for the type and level of fuels management, most of these factors remain constant under each of the alternatives. Suppression efficiency and effectiveness analysis is conducted at the activity planning level of management.

Due to the fragmented ownership pattern in most of the planning area, wildfire potential is not dependent on BLM land management activities alone. Historically, the majority of large stand replacement wildfires have involved multiple ownerships and either started in, or were intensified by, untreated logging and precommercial thinning slash fuel. Fire intensity and severity has also increased due to the exclusion of fires from fire dependent ecosystems. Salvage of dead and dying trees and stands, which could further reduce fuel hazard, is not proposed for all land allocations under all alternatives.

Escaped slash fires have been the primary cause of wildfires throughout the planning area. Wildfires have increased due to timber management activities on both private and public land (see Table 4-41). Certain activities proposed in the alternatives change the risk of large scale, high intensity wildfires. The primary factors that could increase the relative risk of wildfire are: an increased amount of fuel produced through timber management and silvicultural stand treatments (e.g., thinning), and the unnatural buildup of fuels through fire suppression activities and the natural successional changes in ecosystems. Unless fuels are actively managed, this increased risk will affect the objective of limiting the occurrence of large scale, high severity wildfires.

Prescribed burning and other types of fuels management that would reduce fuel buildups could decrease the relative risk of wildfire. Prescribed burning includes both traditional broadcast and pile burning, as well as underburning prior to harvest. Underburning, brushland burning, burning of oak savannas, and grassland burning are also proposed as methods to reintroduce fire into these ecosystems. Each of these ecosystems had some natural fire regime prior to fire suppression and will change in species composition, structure, and function without fire as a natural process. Underburning can be used to reduce fuel loading and vertical fuel continuity. Wildfires in stands that are managed using underburning are generally less severe; this lower severity aids fire suppression by limiting the size of wildfires and enabling use of suppression methods that have a lower environmental impact. These factors reduce the costs of wildfire suppression, particularly when underburning is implemented over large areas (USDI 1992).

Mosaics of stands and landscapes with varying forest ages, structures, and densities and with areas of reduced fuels would allow safe access for fire suppression crews and provide strategic locations for efficient and effective fire suppression. Silvicultural treatments other than prescribed fire would be used in some stands to reduce wildfire hazard. Alternatives C, D, E, and the PRMP would have the greatest likelihood of decreasing the risk of wildfires from natural fuels because underburning would abate some of the natural fuel buildup. Conversely, Alternatives NA, A, and B would have the least effect on reducing wildfire hazard. The specific effects of fuel reduction to mitigate wildfire risk cannot be fully assessed at this planning scale but should be considered in province-level, watershed and landscape-level analyses, as well as in site-specific planning.

Unless managed effectively, management activities such as forest thinning, conifer release by cutting hardwoods, and thinning of the forest understory will produce fuels that would remain a fire hazard until the material is reduced by natural decomposition (10 to 20 years). Thinning or brushing early in early successional stages can help mitigate these fuel hazards. Operationally, some timber harvest units planned for treatment with prescribed fire could not be completed due to timing objectives for reforestation. These “untreated” acres would directly contribute to fuel hazard.

Underburning proposed in the alternatives would also reduce the risk of wildfire. Alternatives C, D, E, and the PRMP have the highest likelihoods of reducing the risk of wildfire through underburning, while Alternative B has a somewhat lower potential. Alternatives NA and A, which do not propose underburning, would have increased risk of wildfire.

Table 4-41. Wildfire Occurrence on the District (1980 to 1992)

	Number of Human-Caused Fires	Human-Caused Acres Burned	Number of Lightning Fires	Lightning Acres Burned	Total Number of Fires	Total Acres Burned
1980	4	12	0	0	4	12
1981	4	11	1	1	4	12
1982	3	20	1	0.3	4	20.3
1983	4	6	0	0	4	6
1984	6	13	0	0	6	13
1985	8	176	2	0.2	10	176.2
1986	7	111	0	0	7	111
1987	8	111	0	0	8	111
1988	11	41	2	0.2	13	41.2
1989	7	20	1	0.1	8	20.1
1990	9	44	0	0	9	44
1991	14	279	0	0	14	279
1992	10	18	0	0	10	18
Average 1980-92	7.3	66.3	0.5	0.1	7.8	66.4

Prohibition of burning within the Rural Interface Areas in Alternatives D and E would increase the potential risk of wildfire in these areas from untreated fuels. This risk can sometimes be decreased by the use of alternative fuel treatments. The projected harvest acres and corresponding level of untreated slash under Alternatives D and E would be greater than for the PRMP.

Conclusion

Alternatives A and B would increase the potential risk of wildfire over the NA due to their increase in the amount of untreated slash and lack of, or small amount of, planned underburning. Alternatives C, D, E, and the PRMP would reduce the risk of wildfire compared to the NA by increased fuels management, including the use of underburning. Under all alternatives, the BLM will continue to contract with the State of Oregon for fire suppression—including prevention and detection. While the costs of the contract and actual fire suppression costs cannot be determined beforehand, the costs will vary under the range of alternatives.

Management activities that reduce fuel hazards would help reduce potential wildfire risk, and yet the potential for wildfire on all lands in the planning area under all alternatives is expected to remain high for the short term. This expectation is due to the continued increase in fuel hazard from timber management activities, conifer mortality associated with drought, and unnatural accumulations of fuels within established stands due to historical suppression of wildfire in some fire dependent or fire adapted plant communities. A total fire protection strategy is likely to be unsuccessful in providing protection against catastrophic disturbance in the planning area over the next 50 to 100 years, while fire severity will become skewed towards higher severity levels. Because the risk of large, high severity wildfires and the potential mitigation of that risk is best evaluated at the watershed level, it was not assessed in this RMP.

Consistency with Other Agency Plans and Programs

General

BLM planning regulations require that RMPs be "consistent with officially approved or adopted resource-related plans and the policies and procedures contained therein of other federal agencies, state and local governments, and Indian tribes, so long as the guidance and RMPs are also consistent with the purposes, policies and programs of federal laws and regulations applicable to public lands..." (43 CFR 1610.3-2). Consistency is construed as the absence of conflict. Based on BLM's knowledge of the plans of such other agencies, the proposed RMP has been compared to the following agencies' plans for consistency, and BLM has reached the conclusions stated.

Federal Agencies

The Proposed RMP is believed to be consistent with the following plans of other federal agencies:

- The Record of Decision for *Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl.*
- The Forest Service's forest-wide land use plans for the adjacent Siskiyou and Siuslaw National Forests.
- Soil Conservation Service watershed plans.
- The Coastal Barrier Improvement Act of 1990 and draft (proposed) Pacific Coastal Barriers Study for areas under consideration for inclusion in the Coastal Barriers Resource System, as administered by the U.S. Fish & Wildlife Service.
- The National Park Service's Nationwide Rivers Inventory (see Effects on Wild and Scenic Rivers).
- The Bonneville Power Administration's latest annual Transmission System Facilities Resource Program.
- The Northwest Power Planning Council, Columbia River Basin, Fish and Wildlife Program and subordinate species-specific strategies.
- The Endangered Species Act and the following Fish and Wildlife Service plans (see Effects on Threatened and Endangered Species):
    - Pacific Bald Eagle Recovery Plan
    - Final Draft Northern Spotted Owl Recovery Plan
    - Fish and Wildlife Service determination of critical habitat for the northern spotted owl
    - The Pacific States Peregrine Falcon Recovry Plan
    - Aleutian Goose Recovery Plan

State Government

The Proposed RMP is believed to be consistent with the following plans, programs, and policies of State of Oregon agencies:

- Department of Environmental Quality (see Effects on Air Resources).
- Smoke Management Plan.
- Visibility Protection Plan and air quality policies.
- Prevention of Significant Deterioration requirements.
- Water Resources Department river basin programs for the Mid-Coast, Umpqua, South Coast, and Rogue River basins.
- Water Resources Commission rules and statutes.
- Department of Human Resources, Health Division, standards for public water systems.
- Department of Agriculture.
- Weed control plans.
- State-listed endangered plant species (see Effects on Special Status and SEIS Special Attention Species).

- Division of State Lands.
- Removal - Fill Law.
- Parks and Recreation Department.
- Statewide Comprehensive Outdoor Recreation Plan (see Effects on Recreation).
- State Parks and Recreation System Plan.
- State Recreation Trails Plan (see Effects on Recreation).
- State Historic Preservation Program.
- Oregon Beach Law.
- State Scenic Waterways Program and related projects.
- Department of Transportation, Highway Division.
- Oregon Highway Plan.
- Six-Year Highway Improvement Plan.
- Economic Development Department, Regional Economic Development Strategies.

Consistency of the alternatives with some other State plans and programs is more complex, as described in the following discussions.

Consistency with the Department of Environmental Quality's Statewide Water Quality Management Plan (including Water Quality Standards and Guidelines) and the State's antidegradation policy would vary by analyzed watershed. The cumulative effects of timber harvest activities on BLM-administered lands, plus other ownerships, could lead to violation of the state's antidegradation policy in one or more of the watersheds analyzed unless either private activities are less than anticipated (by BLM) or BLM can lessen the cumulative impacts by scheduling its timber sales to occur at different times than most of the anticipated private timber harvest.

Consistency with the Department of Fish and Wildlife's many plans, policies, rules, and objectives is addressed in Appendix FF.

Consistency with the Board of Forestry's Forestry Program for Oregon (FPFO) is complex due to the diversity of FPFO goals. Specificity regarding consistency with the five FPFO objectives is provided in Appendix FF.

By designating only some of the potential research natural areas identified in the Natural Heritage Program administered by the Division of State Lands, the proposed plan would be inconsistent with that program. See Chapter 4, Effects on Special Areas, for further discussion.

The proposed plan would be consistent with the Oregon Benchmarks (Report to the 1993 Legislature by the Oregon Progress Board, December 1992) for water, forest land, wetlands, fish and wildlife, and outdoor recreation. It would not, however, be likely to support reaching the 1995 and 2000 benchmarks for increasing standard of living, affordable housing, family stability, and stable home life.

Consistency with the statewide planning goals and guidelines administered by the Land Conservation and Development Commission (LCDC) through the Department of Land Conservation and Development is variable among the 15 goals relevant to the Coos Bay District plan. Oregon's land use program was enacted 21 years ago. Today, a complex body of land use policy and goal interpretations exists due to the acknowledgment process, goal amendments, LCDC rule making, and Land Use Board of Appeals and appellate court decisions. The matter of BLM consistency with the statewide goals involves a number of interrelated issues of policy, intergovernmental coordination, and state and federal legal requirements. Consistency with these goals is characterized generally in Appendix FF. That discussion also addresses consistency of BLM's Proposed RMP with the goals established for the Oregon Coastal Management Program (OCMP).

The statewide planning goals are legally binding on all planning activity relating to land use undertaken by cities, counties, special districts, and state agencies. The planning goals function similarly for affected federal agencies that make consistency determinations under the OCMP in accordance with the (Federal) Coastal Zone Management Act (CZMA). All applicable local government plans have been acknowledged by LCDC to be in conformance with the CZMA, and all state agency programs and activities have been certified by LCDC to be in conformance with the CZMA. Local governments will be revising their plans over the next few years to comply with recent administrative rule revisions related to Goals 4 and 12 which increase protection of forest lands and resources from conflicting uses and inappropriate rural development.

A section of the CZMA requires that "each federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manner which is, to the maximum extent practicable, consistent with approved state management programs" [Subsection 308(c)(1)]. The term "to the maximum extent practicable" means that federal agency's activities must be consistent with mandatory, enforceable, and federally-approved state coastal zone policies whenever the agency has discretion under federal law to abide by state policies. The CZMA does not, however, impose a higher duty on federal agencies than a state requires of its own agencies.

The OCMP mandatory enforceable policies consist of the statewide planning goals, acknowledged city and county comprehensive plans and land use regulations, and the statutory authorities and regulations of state agencies listed in the OCMP. Although federal lands are excluded from the boundaries of the coastal zone, the "directly affecting" provision requires federal agencies to examine their activities for offsite effects. An effect may be either a primary, secondary, or cumulative effect on the coastal zone.

Local Government

The Oregon statewide planning program attached substantial importance to the coordination of federal plans with acknowledged local comprehensive plans. To the extent that BLM actions and programs are consistent with acknowledged county and city comprehensive plans and land use regulations, they can also be considered consistent with statewide planning goals. Local plans do not, however, address protection of Goal 5 values from the effects of forest management, as state law prohibits local governments from regulating forest practices. The comprehensive plan for Coos, Curry, and Douglas counties could be affected by BLM's Coos Bay District RMP.

The district has contributed data for development of county comprehensive plans, followed the development of those plans through the years, and consulted on issues of mutual interest. Based on knowledge gained through this involvement, the district planning staff believes that the Proposed RMP is consistent with the comprehensive plans and land use regulations cited above.

Tribal and Other Agency Plans

The Confederated Tribes of Coos, Lower Umpqua, and Siuslaw, and the Coquille Indian Tribes control lands within the planning area, but have no officially approved or adopted resource-related plans that establish expectations related to possible RMP decisions by BLM.

Chapter 5
Consultation and Coordination

Summary of Major Changes

The following six sections were added to Chapter 5 between the draft and final RMPs:

- Protest procedures.
- Consistency review discussion.
- Public involvement that preceded the draft.
- Public involvement since publication of the draft.
- Discussion of President Clinton's forest conference.
- Summary of comments received on the draft.

Introduction

The Coos Bay District Proposed Resource Management Plan/Final Environmental Impact Statement (PRMP/FEIS) was prepared by an interdisciplinary team of specialists from the district office with assistance from the Oregon State Office (see List of Preparers at end of Chapter 5). Writing of the draft RMP began in early 1991; however, an elaborate planning process that began in 1986 preceded the writing phase. The planning process involved many steps including: collection of resource inventory data, consolidation of resource data, development of a Geographic Information System to handle the data, scoping with public participation, and consultation and coordination with many agencies and organizations.

Protest Procedures

The resource management planning process includes an opportunity for administrative review by means of a plan protest to the BLM Director if it is believed the approval of the PRMP would be in error. (See 43 CFR 1610.5-2). Adherence to the following guidelines will assist in preparing a protest that will assure the greatest consideration of a specific point of view.

Only persons or organizations who participated in our planning process leading to the Coos Bay District PRMP may protest. If district records indicate that a protesting party did not have any written involvement in any stage in the preparation of the PRMP, the protest will be dismissed without further review.

A protesting party may raise only those issues which he/she submitted for the record during the planning process. New issues raised in the protest period should be directed to the Coos Bay District Manager for consideration in plan implementation, as potential plan amendments, or as otherwise appropriate.

The period for filing a plan protest begins when the Environmental Protection Agency publishes in the Federal Register its Notice of Availability of the final environmental impact statement concerning the proposed RMP. The protest period extends for 30 days. There is no provision for any extension of time. To be considered "timely," your protest must be postmarked no later than the last day of the protest period. Although certified mail is not a requirement, we suggest that you send your protest by certified mail, return receipt requested. Protests must be filed in writing to:

Bureau of Land Management
Division of Planning and Environmental Coordination (WO-760)
1849 "C" Street, NW
Washington, DC 20240

To be considered complete, a protest must contain, at a minimum, the following information:

1. Name, mailing address, telephone number, and interest of the person filing the protest.

2. A statement of the issue or issues being protested.

3. A statement of the parts of the PRMP being protested. To the extent possible, this should be done by reference to specific pages, paragraphs, sections, tables, maps, etc. included in the document.

4. A copy of all documents addressing the issue or issues that you submitted during the planning process, or a reference to the date the issue or issues were discussed by you for the record.

5. A concise statement explaining why the BLM State Director's decision is believed to be incorrect. This is a critical part of your protest. Document all relevant facts. As much as possible, reference or cite the planning documents, environmental analysis documents, available planning records (e.g., meeting minutes or summaries and correspondence). A protest which merely expresses disagreement with the Oregon/Washington State Director's proposed

> decision, without any supportive data, will not provide us with the benefit of your information and insight. In this case, the Director's review will be based on the existing analysis and supporting data.

Consistency Review

Prior to approval of the RMP, the State Director will submit the plan to the Governor of the State of Oregon and request identification of any known inconsistencies with state or local plans, policies or programs. The Governor will have 60 days to identify inconsistencies and provide recommendations in writing to the State Director.

Consistency of the plan with the resource related plans, programs and policies of other federal agencies, state and local government, and Indian tribes will be reevaluated in the future as part of the formal monitoring and periodic evaluations of the plan.

Public Involvement Prior to the Publication of the Draft RMP/EIS

Public involvement has been an integral part of BLM's resource management plan process from its onset. Activities that preceded publication of the draft RMP/EIS included several information mailers or brochures; public, group, and open-house meetings; field trips; distribution and review of planning documents; comment periods; informal contacts; written letters; and responses to comments. A May 1986 mailer initiated the effort by asking for input on the types of public involvement activities in the RMP preparation process.

A notice was published in the Federal Register on August 28, 1986 (Volume 51, number 167, page 30718) and in the local news media announcing the formal start of the planning process. At that time, a planning brochure was sent to the public requesting comment on planning issues, goals and objectives for the Coos Bay District.

A September 1986 mailer outlined the overall planning schedule and requested comments on the first major planning step, Issue Identification. This planning step was also announced in *The World*, a daily newspaper published in Coos Bay, and several local weekly newspapers. The public was invited to identify any issues or concerns they believed should be addressed in the RMP process.

During this planning step, each western Oregon district hosted an open house to acquaint local citizens with the planning process and schedule and to discuss issues related to the planning process. Total attendance was 24 people for the two open-house meetings held in Coos Bay in October 1986.

Based on public comments received statewide during the Issue Identification step, BLM prepared another district mailer in March 1987 that summarized publicly-identified issues and concerns. Also addressed in this mailer were the second and third planning steps: Development of Planning Criteria (including State Director guidance) and Collection of Inventory Data. The mailer included a schedule of each western Oregon district's public meetings and field trips planned to provide review and discussion on the technical elements of inventory collection, particularly forest inventory techniques. The mailer identified a proposed timber harvest computer model and asked for public comment specific to the model. Eleven people attended the two open-house meetings, held in May 1987 in Coos Bay, where BLM described the method used in conducting the Timber Production Capability Classification and Operation Inventory for the planning process.

In August 1987, BLM distributed another mailer specific to the Planning Criteria and the proposed State Director Guidance, and requested comments on relevant topics for the latter. The mailer included a schedule for public demonstration of the proposed timber harvest computer model. Demonstrations were conducted in Roseburg and Portland in September of 1987, with 14 people attending the Roseburg demonstration of the proposed TRIM-PLUS Allowable Harvest Model. The Roseburg session also included a comparison of other harvest models to the TRIM-PLUS model.

In January 1988, a mailer was distributed to announce the projected availability of the draft State Director Guidance document and to determine who was interested in receiving a copy. The draft was released in May 1988 and mailed to those who requested copies. Additional copies were available through all district offices, as well as open-house meetings held in each district and the state office. The Coos Bay District open house, held June 11, 1988 to discuss the State Director Guidance document, was attended by 31 people. A comment period followed the open-house meetings, and approximately 70 written responses were sent to the State Director by the end of August 1988. The responses included a document submitted by the Coos Bay District Advisory Council. Proposed revisions to the State Director Guidance and responses to public comments were shared with the original respondents for further review and comment in several letters during 1989 and 1990.

The Summary of the Analysis of the Management Situation (AMS) was published and distributed to approximately 350 people who requested copies. Additional copies were available for distribution at the Coos Bay District Office. On February 11, 1991, two open-house type meetings were held to answer questions on the content of the AMS. A total of 38 letters were received from individuals, organizations, or governmental agencies who provided suggestions for improving the AMS, or offered opinions or preferences for structuring the Preferred Alternative. Information from these letters was utilized by the district to update the AMS and assist in the preparation of the draft RMP/EIS.

In July 1991, a mailer was distributed to inform the public about revised State Director Guidance for Formulation of Alternatives and Analytical Techniques Needed to Estimate Effects of Alternatives.

In addition to the above formal notifications, the Coos Bay District prepared 14 separate newsletters, sending copies to approximately 1,000 people on its mailing list to report the status of the planning process. District Advisory Council members have also been briefed at each of their meetings since 1986.

Appendix I-D of the draft RMP/EIS contains additional information on public involvement in preparation of the draft RMP/EIS.

Public Involvement Following Publication of the Draft RMP/EIS

On August 20, 1992, a notice of document availability for the Coos Bay District draft RMP/EIS was published in the Federal Register (Vol. 57, No. 162, pg. 37828) and in local news media.

The draft RMP/EIS was released for public review on August 21, 1992 with the Federal Register Notice printed on Friday, August 28, 1992 (Vol. 57, No. 168, pg. 39199). The closing date for public comments was December 21, 1992.

Approximately 400 of the 1,000 full draft RMP/EISs printed and nearly 1,400 of the 1,500 draft RMP/EIS Summaries printed were distributed to the public. Distribution was accomplished by mailing documents to the people, groups, and agencies requesting copies; and giving the documents to people coming into the office or attending public meetings.

The district held four public meetings to disperse information, answer questions, and solicit input regarding the draft RMP/EIS. Table 5-1 lists the date, place and type of meeting, as well as the number of people attending.

In addition, several other informal meetings and discussions were held with interested people, groups, and organizations (see Table 5-2).

In addition, numerous formal briefings and informal meetings of non-BLM groups and individuals were held to discuss all six western Oregon draft RMPs. These meetings and briefings usually were coordinated by the BLM's Oregon State Office, although the formal briefings were led by former Eugene District Manager, Ron Kaufman. Table 5-3 lists the formal briefings.

The RMP Team or supporting individuals in the Oregon State Office contacted or received input from numerous agencies, organizations, and groups throughout the planning process, including development of the PRMP/FEIS (see Appendix GG for a list of these organizations).

Also, throughout the process, members of the district staff and management team were involved in an ongoing effort seeking public involvement opportunities and making presentations to local groups, service clubs, and associations.

Comments on the Draft RMP/EIS

During the 120-day comment period (August 21 - December 21, 1992), the district received 954 comment letters. Another 54 letters were sent directly to the Oregon State Office, with copies also sent to the district office. Comment letters received

Table 5-1. Public Meetings

Date	No. Attending	Type and Place of Meeting
9/16/92	10	Open-House Public Meeting at the Coos Bay District Office.
9/16/92	3	Open-House Public Meeting at the Coos Bay District Office.
9/21/92	7	Open-House Public Meeting at the Lower Umpqua Senior Center Reedsport.
9/23/92	5	Open-House Public Meeting at the Curry County Fairgrounds.

Table 5-2. Other Meetings

Date	Meeting
8/24/92	Briefing for Representative DeFazio's staff
8/27/92	District Advisory Council
9/03/92	Briefing for the Coos and Curry County Commissioners
9/22/92	Briefing for the Oregon State Governors Forest Planning Team
10/02/92	Association of Oregon Loggers
10/15/92	District Advisory Council
10/22/92	Briefing for the Siskiyou N.F. Supervisor's Office Management Team
10/23/92	Coos Bay Lions Club
10/27/92	Bay Area Chamber of Commerce Timber Committee
10/27/92	Coquille Lions Club
11/19/93	Society of American Foresters
11/30/92	Reedsport City Council
12/07/92	Myrtle Point City Council
12/09/92	Dick VanderSchaaf, Oregon Natural Heritage Program

Table 5-3. External Briefings on the RMP led by Ron Kaufman

Organization	Date of Briefing
U.S. Fish and Wildlife Service, Portland	July 20, 1992
U.S. Forest Service, Washington DC	August 6-13, 1992
Senator Bob Packwood	August 6-13, 1992
Senator Mark Hatfield (Staff)	August 6-13, 1992
Congressman Les Acoin (staff)	August 6-13, 1992
Congressman Bob Smith	August 6-13, 1992
Congressman Peter DeFazio (staff)	August 6-13, 1992
Congressman Mike Kopetski	August 6-13, 1992
Congressman Norm Dix	August 6-13, 1992
Senator Slade Gordon (staff)	August 6-13, 1992
Congressman Ron Wyden	August 6-13, 1992
BLM Washington Office Staff	August 6-13, 1992
Assistant Secretary of the Interior and Staff	August 6-13, 1992
Professional/Conservation Groups based in Washington DC	August 6-13, 1992
House Interior Appropriations Staff	August 6-13, 1992
Senate Interior Appropriations Staff	August 6-13, 1992
O & C Counties Executive Board	August 19, 1992
Environmental Groups (Oregon)	August 20, 1992
Industry Associations (Oregon)	August 20, 1992
District Advisory Council	August 28, 1992
Governor's Forest Planning Team	September 8, 1992
Scientific Review Panel	September 16, 1992
Interagency Spotted Owl Committee	September 16, 1992
Willamette Timbermen	September 17, 1992
Lane County Tax Equalization Group	September 22, 1992
U.S. Forest Service, Willamette NF	October 6, 1992
Oregon State University Faculty	October 8, 1992
Willamette Forestry Council	October 9, 1992
Society of American Foresters, Portland	October 21, 1992
Society of American Foresters, Eugene	October 26, 1992
University of Oregon Faculty	October 27, 1992
University of Washington Faculty	November 2, 1992
Society of American Foresters, Roseburg	November 10, 1992

past the official closing date of the comment period were considered to the extent possible.

Based on the comments received, the BLM has made changes to the draft RMP/EIS to develop the PRMP/FEIS.

Analysis of public comments is not a vote counting exercise. The comments received from letters and public meetings were analyzed so that meaningful changes could be made. Substantive comments were generally the most useful to the BLM in the modification of its draft preferred alternative to its proposed action, although all comments were considered. To help compare the draft and final plans, a summary of the major changes made between the two plans is included at the beginning of each chapter of volume one and at the beginning of each appendix .

Proposed management decisions as published in the PRMP/FEIS are based on four factors: laws, technical information, resource limitations, and public opinion. The BLM consulted with the public continuously throughout the planning process to obtain some of this information. All of the information was considered by the BLM in developing its preferred alternative and in changing the preferred alternative to its proposed action. The PRMP/FEIS is an ecosystem-based plan that must meet the BLM's multiple use mandate, the Federal Land Policy and Management Act, the O&C Act, other laws and regulations, and public needs. Considering some of these conflicting directions, goals, and needs the district has advanced the PRMP/FEIS as the best combination of management actions for managing the land and resources for the present and future needs of the American people.

The National Environmental Policy Act (NEPA) requires the BLM to respond to substantive comments received during the comment period. That response would take one of the following forms:

- Modifying alternatives (including the proposed actions).
- Developing and evaluating new alternatives that address new issues, concerns, and opportunities.
- Supplementing, improving or modifying analysis.
- Making factual corrections.
- Explaining why the comments do not warrant further agency response (taking no action and explaining why the BLM used rationale, authorities, and sources in the draft plan and why the agency's position is maintained in the final plan).

Comment letters received by the district were numbered, read, and coded according to the subjects discussed. Copies of all letters were also routed to management. Once the substantive comments, preferences, and opinions were coded they were sent to the resource specialists for response or consideration. Substantive comments are those that indicate:

- Errors in analysis that has been performed,
- New information that would have a bearing on the analysis.
- Misinformation that may have been utilized and could have affected the outcome of analysis.
- Support of an existing alternative or definition of a substantive new alternative within the range of alternatives considered.

A preference or opinion generally states a position on an issue without supporting that position with proof, data, or references.

Every attempt was made to accurately capture all substantive comments from the letters received. The substantive comments were paraphrased as provided for in NEPA (40 CFR 1503.4), and are grouped by resource along with a response by the BLM in Appendix II.

Most comment letters contained more than one comment, with approximately 8,450 separate comments recorded. Most letters also contained preferences and opinions which are summarized and included below to show the reader the range of views held on the issues. As stated earlier, although analysis of public comments is not a vote counting exercise, preferences and opinions were considered.

Some comments suggested changes that are beyond the BLM's jurisdiction, legal bounds, or planning scope. In such cases the only response taken was to explain why the suggestion is beyond the BLM's authority or scope. Some specific suggestions asked for detailed discussions in the plan; however, many of these details are beyond the scope of this plan. These comments have been retained for consideration in the preparation of future site-specific plans or projects.

Tables 5-4, 5-5, and 5-6 tabulate and summarize some demographic information about the comment letters received by the Coos Bay District on the draft RMP/EIS.

The most frequently used response was a form letter distributed by the Douglas Timber Operators. The form letter had nine possible comments in a "check the box" section, with space provided for additional comments. Additional comments were written on approximately 20 percent of the 601 Douglas Timber Operator form letters received.

The second most frequent form letter was from 130 employees of the C&D Lumber Company.

Copies of all letters received by the district are available for review during normal working hours at the district office.

Appendix GG contains a complete list of agencies, organizations, and individuals that received copies of the draft RMP/EIS, as well as a list of those commenting on the draft RMP/EIS.

Summary of Comments

Approximately 8,450 comments, statements of opinion, or expressions of preferences were recorded in the responses. The responses are summarized below by major topic or resource element to show their diversity.

General RMP/EIS Comments

Approximately 200 comments were received that covered general topics as applied to the entire document, including:

- Organization of the document.
- Size, clarity and/or detail displayed on the maps.
- The public participation process.
- Felt there was either over or under emphasis placed on the O&C Act.
- Felt there was either over or under emphasis placed on the Endangered Species Act.
- Felt that global impacts were not considered.
- Felt that there was either under emphasis placed on multiple use or over emphasis placed on preservation.

Alternatives

The majority of comments received (approximately 6,100) related to either an alternative in its entirety or a particular portion of an alternative. Listed below, by alternative, is a synopsis of the general comments.

No Action Alternative

- Favored portions of the alternative due to its the higher harvest levels, higher economic returns to the local economy, and greater employment opportunities.
- Opposed portions of the alternative based on water quality impacts, the Endangered Species Act, lack of consideration for special areas, and commodity orientation.
- Fifteen commenters favored this alternative for the preferred action.

Alternative A

- Favored portions of the alternative due to its higher harvest levels, higher economic returns to the local or county government, and greater employment opportunities.
- Opposed portions of the alternative based on water quality impacts, lack of consideration for biological or ecological diversity, impacts to the spotted owl, and commodity orientation.
- Two commenters favored this alternative for the preferred action.

Alternative B

- Favored portions of the alternative based on the opinion it meets water quality standards, meets requirements for endangered species, provides higher economic returns to the local and county government, and provides for

Table 5-4. Comment Letters Received by Affiliation (as of 2/24/93)

Agency	No.of Letters	No.of Signatures
Federal government	5	5
State government	6	6
Local government	13	13
Affiliated with organization	51	86
Individuals	919	960
Other (void or repeat)	10	45
Totals	1,004	1,115

Table 5-5. Form of Public Responses Received by the BLM (as of 2/24/93)

Form of Response	No. of Responses
Form letters/cards (5 different types)	799
Letters	196
Resolutions	9
Totals	1,004

Table 5-6. Geographical Location of Responders (as of 2/24/93)

State	No. of Responders
California	7
Idaho	2
Minnesota	1
Oregon	985
Washington	6
Washington D.C.	2
No postmark/address	3
Totals	1,004

greater employment opportunities from higher harvest levels.

- Opposed portions of the alternative based on water quality impacts, the harvest levels, impacts on old-growth, lack of consideration for biological or ecological diversity, and commodity orientation.
- Fifteen commenters favored this alternative for the preferred action.

Alternative C

- Opposed portions of the alternative based on job loss, not utilizing clearcutting as a harvest method, and the speculative nature of computing the allowable sale quantity.

Alternative D

- Favored portions of the alternative based on designation of special areas and protection of the spotted owl.
- Opposed portions of the alternative based on job loss and economic impact on the local economy, the speculative nature of computing the allowable sale quantity, and its preservation orientation.
- Three commenters favored this alternative for the preferred action.

Alternative E

- Favored portions of this alternative based on the protection of soils, water quality, older forests, and biological or ecological diversity, and the designation of special areas.
- Opposed portions of this alternative based on job loss, economic impacts on the local economy, and preservation orientation.
- Eighteen commenters favored this alternative for the preferred action.

Preferred Alternative

- Favored portions of this alternative based on biological and ecological diversity, road closures, riparian protection measures, protection of spotted owls, designation of special areas, the emphasis on multiple use.
- Opposed portions of the alternative based on reductions in timber harvest levels, restrictions on the use of harvesting systems or intensive management practices, spotted owl protection, impacts on the local economy, job loss, social impacts, the increased cost of implementation, the lack of emphasis on the O&C Act, loss of county revenue, impacts on community stability, lack of consideration for contributions made by private lands, lack of consideration for energy consumption, CO_2 emissions, depletion of nonrenewable resources, and its preservation and commodity orientation.
- Two commenters favored this alternative as the preferred action.

Other Alternatives

- A few respondents recommended consideration of the Douglas Project or the Coast Range alternative in developing the preferred alternative.

Resource Elements

Approximately 2,200 comments were not specific to an alternative, but rather related to resource elements. The vast majority were statements of opinions or expressions of preference resulting in differing views (favorable/opposing) on the same topic. Very few comments were made about access, cultural resources, livestock grazing, soils, or wilderness resource elements. In addition to the comments directed to resource elements described below, the following desires were expressed for the majority of elements:

- Update inventories.
- Describe goals and objectives.
- Have more monitoring detail
- Provide more information on budget requirements and the cost of program implementation.

Air

There were expressions of need for more information on consistency with the Oregon Smoke Management Plan, the State Implementation Plan, and planned mitigation for burning.

Biological Diversity

Opposing views were expressed on the management intensity to be permitted within the Old-growth Emphasis Areas (OGEAs) and Connectivity Areas (CAs), whether these areas should be withdrawn or deferred from harvest, and proposed rotation ages for each; how existing old-growth stands should be managed to meet biological diversity objectives (manage or preserve); whether managing for biological diversity is consistent with the O&C Act; the level of green tree retention required to meet objectives.

There were expressions of support for coordination of management activities with all landowners to meet objectives; that private lands managed under the Oregon Forest Practices Act would provide more diversity in the landscape; that land exchanges could provide more opportunities to meet biological diversity objectives; that the Bureau should use a biological or ecological management approach rather than single species management; and that the description for old growth should be changed.

Energy and Minerals Resource

There were expressions generally in favor of maintaining lands open to mineral exploration, that there should be more regulation of mineral operations, and that the BLM should avoid "split estate" on lands, and should consider land exchanges.

Fire

There were expressions of opposing views on the use of fire and the potential impacts on private lands, and general opposition to the use of fire in riparian areas or areas with sensitive soils.

Fish

Comments indicated or questioned the data presented on fish species, inventory methods, and the analytic techniques utilized.

Land and Right-of-Way

There were expressions generally favoring land exchanges for a variety of resource values, and maintaining the right-of-way agreements. Several suggested more discussions were desirable on how private lands are impacted by these programs.

Recreation

Opposing views were expressed on Off-Road-Vehicle designations and the development of trails.

There were expressions of support for establishment of a destination resort, for mountain biking, for new site developments, for back country byways, for road closures, and installation of more signs, for changing terminology from off-road-vehicles to off-highway-vehicles.

There were expressions of opposition for old-growth harvesting as impacting the recreation program, development of recreation sites in the GFMA, use of concessionaires, and the impact of the recreation program on timber harvesting.

Riparian Resources

Opposing views were expressed on whether harvesting should be permitted or prohibited, and the level of protection required for riparian areas (buffers too wide or not wide enough).

There were expressions of support for intermittent stream protection and road closures or restrictions.

There were expressions of opposition for using intensive silvicultural practices, conducting salvage operations, constructing roads, using fire, and permitting livestock grazing in riparian areas.

Roads

There were opposing views on whether roads should remain open or be closed.

There were expressions favoring a more aggressive maintenance program, seeking more funding for the road program, and proposing development of a transportation management plan.

There were comments opposing road construction within riparian areas to reduce impacts on fish.

Rural Interface Areas

There were opposing views on the level of management that should occur within these areas and the use of silvicultural practices that should be permitted.

There were expressions of support for exchanging lands, limiting access, and having more public involvement and long-range planning for the management within these areas.

There were expressions of opposition to provide any protection beyond that required in the Oregon Forest Practices Act for visual resource management constraints in the rural interface areas.

Socioeconomic Conditions

Many comments relating to socioeconomics related to one or more of the alternatives as noted above. Comments generally involved impacts on jobs and the local economy, the reduced ability of the counties to continue to provide services, the increased need to provide training for displaced workers, and the cost of such training. Other comments indicated the need for more emphasis on the social impacts on people resulting from any reduction in harvest levels.

Special Areas

In general, comments favored the designation of existing and potential special areas, restricted use of Off-Highway-Vehicles, and road closures in these areas.

There were expressions of support to designate potential special areas as both Research Natural Areas and Areas of Critical Environmental Concerns, rather than just the latter.

Special Status Species

Many comments on special status species related to one or more of the alternatives as noted above.

In general, there were many opposing views on the level of protection that should be provided for the spotted owl and the economic cost of providing this protection. There were also opposing views about including human costs in the decision, adopting the spotted owl recovery plan, and having management proposals comply with either the Endangered Species Act or the O&C Act.

There were expressions of support for more discussion on the marbled murrelet, snowy plover, and special status plant species, and for updating the status of several species.

There were opposing views on the effects of managing OGEAs and CAs on special status species.

Timber Resources

A majority of the comments on timber resources related to one or more of the alternatives as noted above.

In general, there were many opposing views on the timber harvest systems and practices which should be utilized, the intensity of silvicultural practices to be employed, the use of clearcutting, old-growth harvesting or preservation, and the allowable sale quantity.

There were expressions of support for prompt reforestation of harvested areas, management of hardwood stands, increased salvage or small sale operations, and the use of adaptive management techniques or practices while retaining flexibility in their implementation.

There were expressions of opposition to the increased use of genetically-improved planting stock, the use of herbicides and pesticides, and the allowable cut effect.

There were also expressions for the need to update the inventory, provide more discussion on forest health, and consider different rotation lengths.

Vegetation

There was an indication for the need to expand the discussions on forest health, management of Port-Orford-cedar, and hardwoods.

There were expressions of support for the control of noxious weeds, but opposition to the use of herbicides for such control.

Visual Resources

In general, there were expressions of concern that visual resource management could not be accomplished by the district based on the checkerboard ownership pattern, and the effect of visual constraints on the allowable sale quantity.

Water Resources

In addition to the comments on riparian resources described above, there were expressions of support to reduce the size of analytical watersheds for analytical purposes, increase coordination and cooperation of all landowners within a watershed for planning activities, and to have more intensive management plans for watersheds.

There were expressions opposing the use of the DEQ's Statewide Assessment of Nonpoint Sources of Water Pollution report.

Wild and Scenic Rivers

There were opposing expressions of concern on the methods utilized for determining the eligibility and suitability of rivers.

Wildlife

There were opposing views on the management/use of forage seeding and wildlife tree (both green and dead) retention.

There were expressions of support for closing roads to benefit big game, retaining coarse woody debris, and managing intermittent streams for wildlife benefits. There were expressions for more discussion of particular species or groups of species, such as neotropical birds.

There were expressions of opposition to using the Wisdom model in managing for elk populations.

Comments from Governmental Agencies, Elected Officials

Due to the volume of comments received, only letters from government agencies, elected officials, and Native American groups were reproduced in Appendix HH. This selective letter reproduction does not imply lesser importance was given to letters received from non-governmental individuals and groups. Substantive comments were paraphrased and summarized as provided for in NEPA (40 CFR 1503.4) to save space and taxpayer money. Where duplicate letters were sent to both the Oregon State Office and the Coos Bay District Office, only one letter was reproduced.

President Clinton's Forest Conference

In response to the controversy concerning management of federal lands, President Clinton held a Forest Conference in Portland, Oregon, on April 2, 1993. During the day-long conference, scientists, economists, representatives from the forest products industry and environmental groups, Indian Tribes, and others were invited to present concerns, opinions, or proposals to the President concerning the various issues surrounding management of federal lands in the Pacific Northwest and northern California.

The FEMAT Report and Draft SEIS

After the Forest Conference, the Forest Ecosystem Management Team was assembled to prepare an assessment that took an ecosystem approach to forest management. The Assessment Team examined many options, evaluated them, and developed and presented ten options in their report—*Forest Ecosystem Management: An Ecological, Economic, and Social Assessment* (the FEMAT Report).

Using the FEMAT Report, the Supplementary Environmental Impact Statement Interdisciplinary Team prepared the *Draft Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Related Species Within the Range of the Northern Spotted Owl.* The Assessments Team's ten options were used as alternatives. The Draft SEIS was available for review on July 30, 1993.

The Bureau of Land Management was invited to comment on the Draft SEIS along with other state and federal agencies, interest groups, and the public. At public hearings held in Oregon, Washington, and California, testimony or written comments were received from 359 individuals. The BLM participated in the coordination of these hearings.

During the 90-day comment period on the draft SEIS, 101,894 letters were received from all 50 states and several foreign countries. Approximately 40 percent of the letters came from east of the Mississippi River, indicating that the forest management issue extends beyond the three states directly involved.

Comment analysis for the draft SEIS showed the subjects that received the most substantive comments were: allocations (17.7 percent), ecosystem (15.2 percent), silviculture (9.8 percent), and economic effects (7.7 percent). Comments related to BLM's draft RMPs represented 0.1 percent.

The comments indicate that the feelings and issues surrounding the management of the national forests and BLM-administered lands in Oregon, Washington, and California remain intense and polarized.

A detailed description of the public comments and analysis can be found in the Final SEIS released in February 1994.

List of Preparers

Name/Position	Responsibility	Qualifications
District Management		
Melvin Chase District Manager	Management Guidance	BS Forest Management University of Minnesota BLM Resource Management Experience in four western Oregon Districts and the Washington Office (32 years)
Daryl Albiston Tioga Area Manager	Management Guidance	BS Biology/Plant Science Boise State University Boise Interagency Fire Center (5 years) BLM Natural Resource Management (12 years)
Neal Middlebrook Myrtlewood Area Manager	Management Guidance	BS Wildlife/Range Management Humbolt State University MS Public Administration Utah State BLM Range Conservation (4 years) Wildlife Biology (8 years) Washington Office (7 years) Area Manager (3 years)
Terry Richards Umpqua Area Manager	Management Guidance	AAS New York Ranger School BS Natural Resource Management New York State College of Forestry Graduate studies in Forest Ecology and Silviculture University of Montana and Montana State University BLM Forest Management, Area Manager (19 years)
Coos Bay District RMP Team		
James Batdorff District Silviculturist	Vegetation-Forestry	BS Forest Management Michigan Technological University Silvicultural Institute - OSO BLM Forestry/Silviculture (30 years)

Daniel P. Carpenter District Hydrologist	Water Resources	BS	Soil Science Washington StateUniversity Watershed Science &Forestry Washington State University, University of Washington
		USFS	Hydrologist (15 years)
		BLM	Hydrologist (3 years)
Marilou Enerson Computer Specialist	Document Production	BLM	Clerk Typist (12 years) Computer Specialist (3 years)
David Fauss District Forest Inventory Specialist	Forest Inventory ASQ Determinations Volume and Growth Projections	BS	Forest Management University of Montana
		MS	Forest Management University of Montana Post Graduate Studies in Tropical Forestry
		BIA	Forest Planning/Inventory (7 years) Latin America-Planning/Inventory (3 years)
		BLM	Inventory Specialist (16 years)
W. Lance Finnegan District GIS Coordinator	GIS Support & Training	BA	Biology Pieffer College
		BS	Forestry New York State College of Forestry
		BLM	Forest Management (27 years)
Robert Foisy District Forester	Timber Resources Biological Diversity Rural Interface Socioeconomics	BS	Forest Management University of Illinois
		BLM	Forest Management, Area Manager (32 years)
Lloyd Fritz District Geologist	Mineral Resources	BA	Geography
		BS	Geology
		MS	Geology Eastern Washington University
		US	Coast Guard - Meteorologist/Geo-Oceanography (2 years)
			Private Industry - Exploration Geologist (2 years)
		BLM	Geologist (22 years)

Name/Position	Responsibility	Qualifications
Craig Garland District Soil Scientist	Soils Resources	BS Forestry, Soils, Range Management University of Idaho SCS Soil Scientist (7 years) BLM Soil Scientist (20 years)
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Thomas Green District Realty Specialist	Lands, Realty & Access	AS Forestry Florida State Ranger School Private Industry - Forestry (3 years) Bureau of Reclamation - Realty (2 years) BLM Lands, Realty, Access (12 years)
Robert Gunther Planning & Environmental Coordinator	RMP Team Leader Document Preparation	BS Forest Management N.Y. State College of Forestry BLM Forester, Area Manager, Planner (32 years)
Chris Hamilton Forester	Ten-Year Representative Timber Management Scenarios	BS Forest Management Clemson University BLM Forest Management (16 years)
Kathleen Helm Writer-Editor	Document Preparation	Southern Oregon State College Southwestern Oregon Community College BLM Writer-Editor (12 years)
William F. Hudson District Fisheries Biologist	Riparian Areas Fish	BS Wildlife Management MS Biology Tennessee Technical University BLM Biologist (14 years)
Annette Langenstein Visual Information Specialist	Document Production	BLM Typesetting, Wordprocessing (7 years)

Larry Mangan District Wildlife Biologist	Biological Diversity Wildlife Resources	BS Biology Loyola University Graduate Studies - Wildlife Management Humbolt State University BLM Wildlife Biologist (20 years)
Larry Matthews District Fire Management Officer	Air Resources Global Climate	USFS Fire and Timber Management (14 years) BLM Fire Management (16 years)
Steven Morris Environmental Protection Specialist	Document Preparation	BLM Civil Engineering Technician years) Visual Information Specialist (5 years) Environ. Protection Specialist (10 years)
Bruce Rittenhouse District Botanist	Special Status Plants	BS Botany Oregon State University MS Plant Ecology Idaho State University USFS Botanist (4 years) BLM Botanist (3 years)
Dennis Turowski District Outdoor Recreation Planner	Recreation Visual Resources	BS Environmental Design University of Massachusetts MS Park & Recreation Resources Michigan State University Smithsonian/Peace Corps - Park Admin. (3 years) State of Massachusetts Park & Recreation Specialist (2 years) BLM Recreation Planner, Planning Team Leader, Natural Resources Specialist (13 years)

Oregon State Office Support

Dale E. Bays State Office Economist	Timber Supply Analysis	BS Forestry New York State College of Forestry Graduate Studies in Economics N.Y. State College of Forestry Utah State University BLM Economist (23 years)

Name/Position	Responsibility	Qualifications
Chris Cadwell Natural Resource Specialist	Computer Analysis	BS Forest Management Humbolt State University BLM Forestry (13 years)
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Rebecca Gravenmier Natural Resource Specialist/ GIS User Analyst	GIS Coordination and Development of GIS Computer Programs	BS Range Management Utah State University BLM GIS (8 years)
Phillip Hamilton Planning Process Coordinator	RMP/EIS Coordination	BS Forestry State University of New York Graduate Studies in Public Administration and Economics BLM Planning Coordination (37 years)
Jeffery S. Nighbert Senior Technical Specialist for Land Information Systems	GIS Technical Advisor, Biological Diversity Team, Hexagon Analysis	BS Specializing in Geography MA Geography University of New Mexico BLM GIS Specialist (16 years)
Leslie Frewing-Runyon Economist	Socioeconomics	BA Economics Willamette University BLM Economics (5 years)
Corey Plank Cartographer	Cartography	BS Geography Oregon State University BLM (7 years)

Former Team Members

Ralph Culbertson District T & E Species Coordinator	Special Status Species, Northern Spotted Owl	BS Wildlife Biology and Range Idaho State University Graduate Studies-Wildlife Biology Idaho State University BLM Wildlife Biologist, Supervisory Natural Resources Specialist, and T & E Species Coordinator (22 years)
Reginald Pullen District Archaeologist	Cultural Resources Special Areas Wild & Scenic Rivers	BA English Linfield College MAIS Anthropology & Fisheries Oregon State University BLM Archaeologist, Recreation, Botany, Wilderness (16 years)

Other Contributors

David A. Perry Professor of Ecosystem Studies	Conceptual design of biological diversity elements of Alternative C.	Department of Forest Science, Oregon State University
Zane G. Smith Retired Regional Forester	Conceptual design of biological diversity elements of Alternative C.	US Forest Service

Chapter 6
Glossary, Index and References

Glossary

Activity Plan - A document that describes management objectives, actions, and projects to implement decisions of the RMP or other planning documents. Usually prepared for one or more resources in a specific area.

Adaptive Management Areas - Landscape units designated for development and testing of technical and social approaches to achieving desired ecological, economic, and other social objectives.

Age Class - One of the intervals into which the age range of trees is divided for classification or use.

Airshed - A geographical area that shares the same air mass due to topography, meteorology, and climate.

Allowable Cut Effect (ACE) - The expected contribution to the PSQ resulting from future management decisions.

Allowable Sale Quantity (ASQ) - The gross amount of timber volume, including salvage, that may be sold annually from a specified area over a stated period of time in accordance with the management plan. Formerly referred to as "allowable cut."

Anadromous Fish - Fish that are born and reared in freshwater, move to the ocean to grow and mature, and return to freshwater to reproduce. Salmon, steelhead, and shad are examples.

Analysis of the Management Situation (AMS) - A document that summarizes important information about existing resource conditions, uses and demands, as well as existing management activities. It provides the baseline for subsequent steps in the planning process, such as the design of alternatives and affected environment.

Analytical Watershed - For planning purposes, a drainage basin subdivision of the planning area used for analyzing cumulative impacts on resources.

Animal Damage - Injuries inflicted—usually by mammals and birds— upon forest tree seed, seedlings, and young trees through seed foraging, browsing, cutting, rubbing, or trampling.

Animal Unit Month (AUM) - The amount of forage necessary for the sustenance of one cow or its equivalent for one month.

Aquatic Ecosystem - Any body of water—such as a stream, lake, or estuary, and all organisms and nonliving components within it— functioning as a natural system.

Aquatic Habitat - Habitat that occurs in free water.

Archaeological Site - A geographic locale that contains the material remains of prehistoric and/or historic human activity.

Area of Critical Environmental Concern (ACEC) - An area of BLM-administered lands where special management attention is needed to protect and prevent irreparable damage to important historic, cultural or scenic values, fish and wildlife resources or other natural systems or processes; or to protect life and provide safety from natural hazards. (Also see Potential ACEC.)

Area of Critical Mineral Potential - An area nominated by the public as having mineral resources of potential importance to the local, regional, or national economy.

Area Regulation - A method of scheduling timber harvest based on dividing the total acres by an assumed rotation.

Automated Resource Data (ARD) - Computerized map data used for the management of resources.

Available Forest Land - That portion of the forested acres for which timber production is planned and included within the acres contributing to the allowable sale quantity (ASQ). This includes both lands allocated primarily to timber production and lands on which timber production is a secondary objective.

Back Country Byway - A road segment designated as part of the National Scenic Byway System.

Basal Area - The area of the cross section of a tree stem near its base, generally at breast height, 4.5 feet above the ground and inclusive of bark.

Baseline - The starting point for analysis of environmental consequences; may be the conditions at a point in time (e.g., when inventory data is collected) or may be the average of a set of data collected over a specified period of years.

Basic Resource Unit (BRU) - A term used in TRIM-PLUS for the smallest unit of timberland that has been identified in the inventory.

Basin Programs - Sets of state administrative rules that establish types and amounts of water uses allowed in the state's major river basins and that form the basis for issuing water rights.

Beneficial Use - The reasonable use of water for a purpose consistent with the laws and best interest of the peoples of the state. Such uses include, but are not limited to, the following: instream, out of stream and groundwater uses, domestic, municipal, industrial water supply, mining, irrigation, livestock watering, fish and aquatic life, wildlife, fishing, water contact recreation, aesthetics and scenic attraction, hydropower, and commercial navigation.

Best Management Practices (BMP) - Methods, measures, or practices designed to prevent or reduce water pollution. Not limited to structural and nonstructural controls, and procedures for operations and maintenance. Usually, BMPs are applied as a system of practices rather than a single practice.

Big Game - Large mammals that are hunted, such as Roosevelt elk, black-tailed deer, and black bear.

Biological Corridor - A habitat band linking areas reserved from substantial disturbance.

Biological Diversity - The variety of life and its processes.

Biological Legacies - Components of the forest stand (e.g. large trees, down logs, and snags) reserved from harvest to maintain site productivity and to provide structure and ecological functions in subsequent forest stands.

Board Foot (BF) - A unit of solid wood that is one foot square and one inch thick.

Broadcast Burn - Allowing a prescribed fire to burn over a designated area within well-defined boundaries for reduction of fuel hazard or as a silvicultural treatment, or both.

Broadcast Burning - A controlled fire that burns within defined boundaries to achieve management objectives.

Bureau Assessment Species - Plant and animal species on List 2 of the Oregon Natural Heritage Data Base, or those species on the Oregon List of Sensitive Wildlife Species (OAR 635-100-040), that are identified in BLM Instruction Memo No. OR-91-57 and are not included as federal candidate, state listed, or Bureau sensitive species.

Bureau Sensitive Species - Plant or animal species eligible for federal listed, federal candidate, state listed, or state candidate (plant) status, or on List 1 in the Oregon Natural Heritage Data Base, or approved for this category by the State Director.

Candidate Species - Those plants and animals included in Federal Register "Notices of Review" that are being considered by the Fish and Wildlife Service (FWS) for listing as threatened or endangered. There are two categories that are of primary concern to BLM. These are:

> Category 1. Taxa for which the FWS has substantial information on hand to support proposing the species for listing as threatened or endangered. Listing proposals are either being prepared or have been delayed by higher priority listing work.
>
> Category 2. Taxa for which the FWS has information to indicate that listing is possibly appropriate. Additional information is being collected.

Casual Use - Activities ordinarily resulting in negligible disturbance of federal lands and resources.

Cavity Excavator - A wildlife species that digs or chips out cavities in wood to provide a nesting, roosting, or foraging site.

Cavity Nester - Wildlife species—most frequently birds—that require cavities (holes) in trees for nesting and reproduction.

Characteristic Landscape - The established landscape within an area being viewed. This does not necessarily mean a naturalistic character. It could refer to an agricultural setting, an urban landscape, a primarily natural environment, or a combination of these types.

Class I (air quality) Areas - Special areas (e.g., national parks and certain wilderness areas) protected for their air quality related values.

Clearcut Harvest - A timber harvest method in which all trees are removed in a single entry from a designated area, with the exception of wildlife trees or snags, to create an even-aged stand.

Coastal Oregon Productivity Enhancement Program (COPE) - A cooperative research and education program to identify and evaluate existing and new opportunities to enhance long-term productivity and economic/ social benefits derived from the forest resources of coastal Oregon.

Commercial Forest Land - Forest land producing or capable of producing at least 20 cubic feet of wood per acre per year of commercial tree species.

Commercial Thinning - The removal of merchantable trees from an even-aged stand to encourage growth of the remaining trees.

Commercial Tree Species - Conifer species used to calculate the commercial forest land ASQ. They are typically utilized as saw timber and include species such as Douglas-fir, hemlock, spruce, fir, pine, and cedar. (Also see Noncommercial Tree Species.)

Commodity Resources - Goods or products of economic use or value.

Community Stability - The capacity of a community (incorporated town or county) to absorb and cope with change without major hardship to institutions or groups within the community.

Community Water System - See Public Water System.

Concern - A topic of management or public interest that is not well enough defined to become a planning issue, or does not involve controversy or dispute over resource management activities or land use allocations or lend itself to designating land use alternatives. A concern may be addressed in analysis, background documents, or procedures or in a noncontroversial decision.

Congressionally Reserved Areas - Areas that require Congressional enactment for their establishment, such as national parks, wilderness, and wild and scenic rivers.

Connectivity - A measure of the extent to which conditions between late-successional/old-growth forest areas provide habitat for breeding, feeding, dispersal, and movement of late-successional/old-growth-associated wildlife and fish species.

Consistency - Under the Federal Land Policy and Management Act, the adherence of BLM resource management plans to the terms, conditions, and decisions of officially approved and adopted resource related plans, or in their absence, with policies and programs of other federal agencies, state and local governments and Indian tribes, so long as the plans are also consistent with the purposes, policies and programs of federal laws and regulations applicable to BLM-administered lands. Under the Coastal Zone Management Act, the adherence to approved state management programs to the maximum extent practicable, of federal agency activities affecting the defined coastal zone.

Constrained Timber Production Base - Acreage managed for timber production at less than full intensity in consideration of nontimber resource management objectives.

Coos Bay Wagon Road (CBWR) Lands - Public lands granted to the Southern Oregon Company and subsequently reconveyed to the United States.

Core Area - That area of habitat essential in the breeding, nesting, and rearing of young up to the point of dispersal of the young.

Cover - Vegetation used by wildlife for protection from predators, or to mitigate weather conditions, or to reproduce. May also refer to the protection of the soil and the shading provided to herbs and forbs by vegetation.

Critical Habitat - Under the Endangered Species Act, (1) the specific areas within the geographic area occupied by a federally listed species on which are found physical and biological features essential to the conservation of the species, and that may require special management considerations or protection; and (2) specific areas outside the geographic area occupied by a listed species when it is determined that such areas are essential for the conservation of the species.

Crucial Habitat - Habitat which is basic to maintaining viable populations of fish or wildlife during certain seasons of the year or specific reproduction periods.

Cubic Foot - A unit of solid wood that is one foot square and one foot thick.

Cull - A tree or log that does not meet merchantable specifications.

Culmination of Mean Annual Increment (CMAI) - The peak of average yearly growth in volume of a forest stand (total volume divided by age of stand).

Cultural Resource - Any definite location of past human activity identifiable through field survey, historical documentation, or oral evidence. Includes archaeological or architectural sites, structures, or places; and places of traditional cultural or religious importance to specified groups whether or not represented by physical remains.

Cultural Site - Any location that includes prehistoric and/or historic evidence of human use or that has important sociocultural value.

Cumulative Effect - The impact that results from identified actions when they are added to other past, present, and reasonably foreseeable future actions regardless of who undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Debris Torrent - Rapid movement of a large quantity of materials (wood and sediment) down a stream channel during storms or floods. This generally occurs in smaller streams and results in scouring of streambed.

Density Management - Cutting of trees for the primary purpose of widening their spacing so that growth of remaining trees can be accelerated. Density management harvest can also be used to improve forest health, open the forest canopy, or accelerate the attainment of old growth characteristics if maintenance or restoration of biological diversity is the objective.

Departure (from even flow) - A timber sale level which deviates from sustainable sale levels through a planned temporary increase or decrease in the ASQ. Must be economically and biologically justified.

Designated Area - An area identified in the Oregon Smoke Management Plan as a principal population center requiring protection under state air quality laws or regulations.

Designated Conservation Area - A contiguous area of habitat to be managed and conserved for spotted owls as described in the U.S. Fish and Wildlife Service's Final Draft Recovery Plan for the Northern Spotted Owl.

Developed Recreation Site - A site developed with permanent facilities designed to accommodate recreation use.

Diameter At Breast Height (dbh) - The diameter of a tree 4.5 feet above the ground on the uphill side of the tree.

Dispersed Recreation - Outdoor recreation in which visitors are diffused over relatively large areas. Where facilities or developments are provided, they are primarily for access and protection of the environment rather than comfort or convenience of the user.

District Defined Reserves - Areas designated for the protection of specific resources, flora, fauna, and other values. These areas are not included in other land use allocations nor in the calculation of the PSQ.

Domestic Water Supply - Water used for human consumption.

Dominant Use - The guiding principle for the management of all O&C lands inventoried as "suitable commercial forest land" whereby such lands are to be managed primarily for timber production on a sustained yield basis with due consideration for the other forest uses identified in the O&C Act and subject to any relevant requirements specified in subsequent legislation. (Examples of such subsequent legislation are the Endangered Species Act and the Federal Water Pollution Control Act.)

Early Seral Stage - See Seral Stages.

Ecological Forestry - A set of forest management concepts that seek to maintain or recreate timber stand and landscape biological diversity. Also termed "New Perspectives," "New Forestry," and "Sustainable Forestry."

Ecological Health - The condition of an ecosystem in which processes and functions are adequate to maintain diversity of biotic communities commensurate with those initially found there.

Economically Feasible - Having costs and revenues with a present net value greater than zero.

Ecosystem Diversity - The variety of species and ecological processes that occur in different physical settings.

Ecosystem Management - The management of lands and their resources to meet objectives based on their whole ecosystem function rather than on their character in isolation. Management objectives blend long-term needs of people and environmental values in such a way that the lands will support diverse, healthy, productive, and sustainable ecosystems.

Edge Effect - An ecologically important biological effect that occurs in the transition zone where two plant communities or successional stages meet and mix.

Effective Old-Growth Habitat - Old-growth forest largely unmodified by external environmental influences (for example, wind, temperature, and encroachment of nonresident species) from nearby, younger forest stands. Also referred to as interior habitat. For purposes of analysis, assumed to be at least 400 feet from an edge with an adjacent stand younger than age class 70.

Eligible River - A river or river segment found—through interdisciplinary team and, in some cases, interagency review— to meet Wild and Scenic River Act criteria of being free-flowing and possessing one or more outstandingly remarkable values.

Endangered Species - Any species defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range and published in the Federal Register.

Environmental Assessment (EA) - A systematic analysis of site-specific BLM activities used to determine whether such activities have a significant effect on the quality of the human environment and whether a formal environmental impact statement is required and also to aid an agency's compliance with NEPA when no EIS is necessary.

Environmental Impact - The positive or negative effect of any action upon a given area or resource.

Environmental Impact Statement (EIS) - A formal document to be filed with the Environmental Protection Agency and that considers significant environmental impacts expected from implementation of a major federal action.

Ephemeral Streams - Streams that contain running water only sporadically, such as during and following storm events.

Established Stand - A reforestation unit of suitable trees that are past the time when considerable juvenile mortality occurs. The unit is no longer in need of measures to ensure survival but is evaluated for measures to enhance growth.

Even-Aged Management - A silvicultural system that creates forest stands primarily of a single age or limited range of ages. Creation of even-aged stands may be accomplished through the clearcut, seed tree, or shelterwood methods.

Existing Stand Condition (ESC) - An artificial classification that groups forest stands with similar management potential into categories matched to tables expressing yield at various stand ages under various combinations of silvicultural treatment.

Extensive Recreation Management Areas (ERMAs) - All BLM-administered lands outside Special Recreation Management Areas. These areas may include developed and primitive recreation sites with minimal facilities.

Forest Canopy - The cover of branches and foliage formed collectively by the crowns of adjacent trees and other woody growth.

Forest Health - The ability of forest ecosystems to remain productive, resilient, and stable over time and to withstand the effects of periodic natural or human-caused stresses such as drought, insect attack, disease, climatic changes, flood, resource management practices, and resource demands.

Forest Land - Land that is now, or is capable of becoming, at least 10 percent stocked with forest trees and that has not been developed for nontimber use.

Forest Succession - The orderly process of change in a forest as one plant community or stand condition is replaced by another, evolving towards the climax type of vegetation.

Fragile Nonsuitable - A TPCC classification indicating forest land having fragile conditions, which, if harvested, would result in reduced future productivity—even if special harvest or restrictive measures are applied. These fragile conditions are related to soils, geologic structure, topography, and ground water.

Full Log Suspension - Suspension of the entire log above the ground during yarding operations.

General Forest Management Area (GFMA) - Forest land managed on a regeneration harvest cycle of 70-110 years. A biological legacy of six to eight green trees per acre would be retained to assure forest health. Commercial thinning would be applied where practicable and where research indicates there would be gains in timber production.

Genetic Diversity - The variety within populations of a species.

Green Tree Retention - A stand management practice in which live trees—as well as snags and large down wood—are left as biological legacies within harvest units to provide habitat components over the next management cycle.

> **High Level -** A regeneration harvest designed to retain the highest level of live trees possible while still providing enough disturbance to allow regeneration and growth of the naturally-occurring mixture of tree species. Such harvest should allow for the regeneration of intolerant and tolerant species. Harvest design would also retain cover and structural features necessary to provide foraging and dispersal habitat for mature and old growth dependant species.
>
> **Low Level -** A regeneration harvest designed to retain only enough green trees and other structural components (e.g., snags and coarse woody debris) to result in the development of stands that meet old growth definitions within 100 to 120 years after harvest entry, considering overstory mortality.

Gross Yarding - Removal of all woody material of specified size from a logging unit to a landing.

Group Resource Unit (GRU) - A term used in TRIM-PLUS for each collection of current and future management instructions and data sources for the Basic Resource Units that are proposed to be managed to meet a particular set of management objectives.

Habitat Diversity - The number of different types of habitat within a given area.

Habitat Fragmentation - The breaking up of habitat into discrete islands through modification or conversion of habitat by management activities.

Habitat Management Plan - See Activity Plan.

Hardwood Site - A forest site occupied by hardwoods that is unsuitable for the production of conifer species.

Hazardous Materials - Anything that poses a substantive present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Hiding Cover - Generally, any vegetation used by wildlife for security or to escape from danger; however, more specifically, any vegetation capable of providing concealment (e.g. hiding 90 percent of an animal) from human view at a distance of 200 feet or less.

Historic Site - A cultural resource resulting from activities or events dating to the historic period (generally post AD l830 in western Oregon).

Home Range - The area which an animal traverses in the scope of normal activities; not to be confused with territory which is the area an animal defends.

Hyporheic Zone - The area under the stream channel and floodplain that contributes to the stream.

Impact - A spatial or temporal change in the environment caused by human activity.

Improved Seed - Seed originated from a seed orchard or selected tree(s) whose genetic superiority in one or more characters important to forestry has been proven by tests conducted in specific environments.

Infiltration (soil) - The movement of water through the soil surface into the soil.

Instant Study Area - A natural area formally identified by BLM for accelerated wilderness review by notice published before October 21, 1975.

Integrated Pest Management (IPM) - A systematic approach that uses a variety of techniques to reduce pest damage or unwanted vegetation to tolerable levels. IPM techniques may include natural predators and parasites, genetically resistant hosts, environmental modifications, and—when necessary and appropriate—chemical pesticides or herbicides.

Integrated Vegetation Management - See Integrated Pest Management.

Intensively Managed Timber Stands - Forest stands managed to obtain a high level of timber volume or quality through investment in growth enhancing practices, such as precommercial thinning, commercial thinning, and fertilization. Not to be confused with the allocations of "lands available for intensive management of forest products."

Intensive Forest Management Practices - The growth enhancing practices of release, precommercial thinning, commercial thinning, and fertilization that are designed to obtain a high level of timber volume or quality.

Intensive Timber Production Base - All commercial forest land allocated to timber production and intensively managed to obtain a high level of timber volume or quality.

Intermittent Stream - Any nonpermanent, flowing drainage feature having a definable channel and evidence of scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two criteria.

Inventory River - A potential wild, scenic, or recreational river identified in the 1982 National Rivers Inventory (NRI) published by the National Park Service.

Irreversible or Irretrievable Commitment of Resources - Effect of an action or inaction that cannot be reversed within a reasonable time.

Issue - A matter of controversy or dispute over resource management activities that is well defined or topically discrete. Addressed in the design of planning alternatives.

Landing - Any place on or adjacent to the logging site where logs are assembled for further transport.

Landscape - A heterogeneous land area with interacting ecosystems that are repeated in similar form throughout.

Landscape Diversity - The size, shape and connectivity of different ecosystems across a large area.

Landscape Features - The land and water form, vegetation, and structures that compose the characteristic landscape.

Land Use Allocations - Allocations that define allowable uses/activities, restricted uses/activities, and prohibited uses/activities. They may be expressed in terms of area such as acres or miles. Each allocation is associated with a specific management objective.

Large Woody Debris - Pieces of wood that are larger than ten feet long and six inches in diameter in a stream channel.

Large Woody Material - Logs on the forest floor that are in pieces at least 24 inches in diameter at the large end.

Late Seral Stage - See Seral Stages.

Late-Successional Forests - Forest seral stages that include mature and old-growth age classes, 80 years and older.

Late-Successional Reserve (LSR) - A forest in its mature and/or old-growth stages that has been reserved.

Leasable Minerals - Minerals that may be leased to private interests by the federal government. Includes oil, gas, geothermal resources, and coal.

Locatable Minerals - Minerals subject to exploration, development and disposal by staking mining claims as authorized by the Mining Law of l872 (as amended). This includes valuable deposits of gold, silver, and other uncommon minerals not subject to lease or sale.

Log Decomposition Class - Any of five stages of deterioration of logs in the forest; stages range from essentially sound (class 1) to almost total decomposition (class 5).

Long Term - The period starting l0 years following implementation of the Resource Management Plan. For most analyses, long-term impacts are defined as those existing 100 years after implementation.

Long-Term Soil Productivity - The capability of soil to sustain inherent, natural growth potential of plants and plant communities over time.

Long-Term Sustained Yield (LTSY) - Estimated timber harvest that can be maintained indefinitely once all stands have been converted to a managed state under a specific management intensity.

Lumber and Wood Products, Except Furniture - An industrial classification that includes logging contractors engaged in cutting timber and pulpwoods: merchant sawmills, lath mills, shingle mills, planing mills, plywood mills, and veneer mills engaged in producing lumber and wood basic materials; and establishments engaged in manufacturing finished articles made entirely or mainly of wood or wood substitutes. Certain types of establishments producing wood products are classified elsewhere; for example, furniture and office and store fixtures are in a different classification.

Major Plant Grouping - An aggregation of plant associations with similar management potential and with the same dominant late seral conifer species and the same major early seral species. Late seral rather than climax species are used because late seral species are usually present rather than climax communities. and because most old-growth plant communities on BLM-administered lands are comprised of late seral species rather than climax species in the upper canopy.

Management Actions/Direction - Measures planned to achieve the stated objectives.

Management Activity - An activity undertaken for the purpose of harvesting, traversing, transporting, protecting, changing, replenishing, or otherwise using resources.

Management Framework Plan (MFP) - A land use plan that established coordinated land use allocations for all resource and support activities for a specific land area within a BLM district. It established objectives and constraints for each resource and support activity and provided data for consideration in program planning. This process has been replaced by the Resource Management Planning process.

Management Intensity (MI) - An expression of a potential type of management for a Group Resource Unit in TRIM-PLUS, expressed as a yield table.

Mass Movement - The downslope movement of earth caused by gravity. Includes but is not limited to landslides, rock falls, debris avalanches, and creep. It does not include surface erosion.

Matrix Lands - Federal land outside of reserves and special management areas that will be available for timber harvest at varying levels.

Mature Seral Stage - See Seral Stages.

MICRO*STORMS - A micro-computer database system providing background information and recommended treatment for each operations inventory unit.

Mid Seral Stage - See Seral Stages.

Mineral Estate - The ownership of the minerals at or beneath the surface of the land.

Mineral Potential Classification System - Method for assessing the potential for the presence of a concentration of one or more energy and/or mineral resources.

Mineral Restriction Categories

Closed Nondiscretionary: Areas specifically closed to mineral exploration and development by authority of law, regulation, Secretarial decision (including Public Land Orders), or Executive Order.

Closed Discretionary: Areas closed to mineral exploration and development by authority of law or regulation, but where such lands can be opened by action of BLM without legislation, regulation change, Secretarial decision, or Executive Order.

Open Standard Requirements: Areas open to mineral exploration and development subject only to requirements over which BLM has no discretionary control such as the Clean Air/Clean Water Acts, National Environmental Policy Act, Resource Conservation and Recovery Act, Coastal Zone Management Act, Endangered Species Act, and the National Historic Preservation Act.

Open Additional Restrictions: Areas open to mineral exploration and development subject to additional restrictions that can be legally required by BLM pursuant to law, regulation, or other legal authority such as ACEC designation, ORV or other closure order, and community pit designation.

Minimum Harvest Age - The lowest age of a forest stand to be scheduled for final harvest.

Minimum Stocking - Reforestation level lower than target stocking. Does not achieve full site occupancy in young stands but is capable of achieving optimal final harvest yield and reduced commercial thinning yield.

Minimum Streamflow - The quantity of water needed to maintain the existing and planned in-place uses of water in or along a stream channel or other water body and to maintain the natural character of the aquatic system and its dependent systems.

Mining Claims - Portions of public lands claimed for possession of locatable mineral deposits by locating and recording under established rules and pursuant to the 1872 Mining Law.

Mitigating Measures - Modifications of actions that (1) avoid impacts by not taking a certain action or parts of an action, (2) minimize impacts by limiting the degree or magnitude of the action and its implementation, (3) rectify impacts by repairing, rehabilitating, or restoring the affected environment, (4) reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action, or (5) compensate for impacts by replacing or providing substitute resources or environments.

Monitoring - The process of collecting information to evaluate if objectives and anticipated or assumed results of a management plan are being realized or if implementation is proceeding as planned.

Mortality Salvage - The harvest of dead and dying timber.

Multi-aged Stand - A forest stand that has more than one distinct age class arising from specific disturbance and regeneration events at various times. These stands normally will have multi-layered structure.

Multi-layered Canopy - Forest stands with two or more distinct tree layers in the canopy; also called multi-storied stands.

Multiple Use - Management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.

Mycorrhizal Fungi - Fungi with a symbiotic relationship with the roots of certain plants.

National Ambient Air Quality Standards (NAAQS) - Standards designed to protect public health and welfare, allowing an adequate margin of safety. For particulate matter less than 10 microns in size (PM_{10}), 50 micrograms per cubic meter annual average and 150 micrograms per cubic meter, 24-hour average, not to be exceeded more than once per year.

National Register of Historic Places - A formal list established by the National Historic Preservation Act of 1966 of cultural resources worthy of preservation. The Register is maintained by the National Park Service and lists archaeological, historic, and architectural properties.

Nonattainment - Failure of a geographical area to attain or maintain compliance with ambient air quality standards.

Nonattainment Area - A geographical area that has failed to attain or maintain compliance with air quality standards. Nonattainment area boundaries are commonly the same as city, standard metropolitan statistical area, or county boundaries.

Nonchargeable Volume - Timber harvest not included in the allowable sale quantity calculations.

Noncommercial Forest Land - Land incapable of yielding at least 20 cubic feet of wood per acre per year of commercial species, or land that is capable of producing only noncommercial tree species.

Noncommercial Tree Species - Minor conifer and hardwood species whose yields are not reflected in the commercial conifer forest land ASQ. Some species may be managed and sold under a suitable woodland ASQ and, therefore, may be commercial as a woodland species.

Nonforest Land - Land developed for nontimber uses or land incapable of being 10 percent stocked with forest trees.

Nongame Wildlife - All wild vertebrate and invertebrate animals not subject to sport hunting.

Nonpoint Source Pollution - Water pollution that does not result from a discharge at a specific, single location (such as a single pipe) but generally results from land runoff, precipitation, atmospheric deposition or percolation, and that normally is associated with agricultural, silvicultural and urban runoff, and runoff from construction activities. Such pollution results in the human-made or human-induced alteration of the chemical, physical, biological, and radiological integrity of water.

Nonsuitable Commercial Forest Land - Sites that would take longer than 15 years to meet or exceed minimum stocking levels of commercial species. Further classified as suitable woodland.

Nonsuitable Woodland - All fragile nonsuitable forest land.

Noxious Plant - A plant specified by law as being especially undesirable, troublesome, and difficult to control.

Noxious Weed - See Noxious Plant.

Nutrient Cycling - Circulation or exchange of elements such as nitrogen and carbon between nonliving and living portions of the environment. Includes all mineral and nutrient cycles involving mammals and vegetation.

Nutrient Depletion - Detrimental changes on a site in the total amount of nutrients and/or their rates of input, uptake, release, movement, transformation, or export.

O&C Lands - Public lands granted to the Oregon and California Railroad Company and subsequently revested to the United States.

Objectives - Expressions of what are the desired end results of management efforts.

Obligate Species - A plant or animal that occurs only in a narrowly defined habitat such as tree cavity, rock cave, or wet meadow.

Off-Highway Vehicle - Any motorized track or wheeled vehicle designed for cross country travel over natural terrain. (The term "Off-Highway Vehicle" is used in place of the term "Off-Road Vehicle" to comply with the purposes of Executive Orders 11644 and 11989. The definition for both terms is the same.)

Off-Highway Vehicle Designation

> **Open**: Designated areas and trails where off-highway vehicles may be operated subject to operating regulations and vehicle standards set forth in BLM Manuals 834l and 8343.
>
> **Limited**: Designated areas and trails where off-highway vehicles are subject to restrictions limiting the number or types of vehicles, date, and time of use; limited to existing or designated roads and trails.
>
> **Closed**: Areas and trails where the use of off-highway vehicles is permanently or temporarily prohibited. Emergency use is allowed.

Old-Growth Conifer Stand - Older forests occurring on western hemlock, mixed conifer, or mixed evergreen sites and that differ significantly from younger forests in structure, ecological function, and species composition. Old growth characteristics begin to appear in unmanaged forests at 175-250 years of age. These characteristics include (1) a patchy, multi-layered canopy with trees of several age classes, (2) the presence of large living trees, (3) the presence of larger standing dead trees (snags) and down woody debris, and (4) the presence of species and functional processes representative of the potential natural community.

For purposes of inventory, old-growth stands on BLM-administered lands are only identified if they are at least ten percent stocked with trees of 200 years or older and are ten acres or more in size. For purposes of habitat or biological diversity, the BLM uses the appropriate minimum and average definitions provided by

Pacific Northwest Experiment Station publications 447 and GTR-285. This definition is summarized from the 1986 interim definitions of the Old-Growth Definitions Task Group.

Old-Growth Seral Stage - See Seral Stages.

Old-Growth-Dependent Species - An animal species so adapted that it can exist only in old growth forests.

Operations Inventory (OI) - An intensive, site-specific forest inventory of forest stand location, size, silvicultural needs, and recommended treatment based on individual stand conditions and productivity.

Operations Inventory Unit - An aggregation of trees occupying an area that is sufficiently uniform in composition, age, arrangement, and condition to be distinguishable from vegetation on adjoining areas.

Optimal Cover - For elk, cover used to hide from predators and avoid disturbances, including man. It consists of a forest stand with four layers and an overstory canopy that can intercept and hold a substantial amount of snow and yet has dispersed, small openings. It is generally achieved when the dominant trees average 21 inches dbh or greater and have 70 percent or greater crown closure.

Outstanding Natural Area (ONA) - An area that contains unusual natural characteristics and is managed primarily for educational and recreational purposes.

Outstandingly Remarkable Values (ORVs) - Values among those listed in Section 1(b) of the Wild and Scenic Rivers Act: "scenic, recreational, geological, fish and wildlife, historical, cultural, or other similar values ..." Other similar values which may be considered include ecological, biological or botanical, paleontological, hydrological, scientific, or research.

Overstory Removal - The final stage of cutting where the remaining overstory trees are removed to allow the understory to grow. Overstory removal is generally accomplished three to five years after reforestation and when adequate stocking has been achieved.

Paper and Allied Products - An industrial classification that includes establishments primarily engaged in the manufacture of pulps from wood and other cellulose fibers and from rags; the manufacture of paper and paperboard; and the manufacture of paper and paperboard into converted products, such as paper coated off the paper machine, paper bags, paper boxes, and envelopes.

Partial Cutting - Removal of selected trees from a forest stand.

Partial Log Suspension - During yarding operations, suspension of one end of the log above the ground.

Particulates - Finely-divided solid or liquid (other than water) particles in the air.

Peak Flow - The highest amount of stream or river flow occurring in a year or from a single storm event.

Perennial Stream - A stream that has running water on a year-round basis under normal climatic conditions.

Personal Income - The income received by all individuals in the economy from all sources. Includes wages and salaries, proprietors' income, rental income, dividends, personal interest income, and the difference between transfer payments (payouts) and personal contributions for social insurance.

Plan Amendment - A change in the terms, conditions, or decisions of a resource management plan.

Plan Maintenance - Any documented minor change that interprets, clarifies, or refines a decision within a resource management plan but does not change the scope or conditions of that decision.

Plan Revision - A new resource management plan prepared by following all steps required by the regulations for preparing an original resource management plan.

Planning Area - All of the lands within the BLM management boundary addressed in a BLM resource management plan; however, BLM planning decisions apply only to BLM-administered lands and mineral estate.

Planning Issue - See Issue.

Plant Association - A plant community type based on land management potential, successional patterns, and species composition.

Plant Community - An association of plants of various species found growing together in different areas with similar site characteristics.

Plantation Maintenance - Actions in an unestablished forest stand to promote the survival of desired crop trees.

Plantation Release - All activities associated with promoting the dominance and/or growth of desired tree species within an established forest stand.

Pool/Riffle Ratio - The ratio of surface area or length of pools to the surface area or length of riffles in a given stream reach; frequently expressed as the relative percentage of each category. Used to describe fish habitat rearing quality.

Potential ACEC - An area of BLM-administered land that meets the relevance and importance criteria for ACEC designation, as follows:

(1) Relevance. There shall be present a significant historic, cultural, or scenic value; a fish or wildlife resource or other natural system or process; or natural hazard.

(2) Importance. The above described value, resource, system, process, or hazard shall have substantial significance and values. This generally requires qualities of more than local significance and special worth, consequence, meaning, distinctiveness, or cause for concern. A natural hazard can be important if it is a significant threat to human life or property.

Potential Natural Community - The community of plants and wild animals that would become established if all successional sequences were completed without human interference under present environmental conditions. For forest communities, the potential natural community is an old-growth conifer stand.

Precommercial Thinning - The practice of removing some of the trees less than merchantable size from a stand so that remaining trees will grow faster.

Prescribed Fire - A fire burning under specified conditions to accomplish certain planned objectives.

Prevention Strategy - The amelioration of conditions that cause or favor the presence of competing or unwanted vegetation.

Priority Animal Taxa - Species or subspecies having special significance for management. They include endangered, threatened, and special status species; species of high economic or recreation value; and species of significant public interest.

Priority Habitats - Aquatic, wetland and riparian habitats, and habitats of priority animal taxa.

Probable Sale Quantity (PSQ) - An estimate of the allowable harvest levels for the various alternatives that could be maintained without decline over the long term if the schedule of harvests and regeneration were followed. "Allowable" was changed to "probable" to reflect uncertainty in the calculations for some alternatives. Probable sale quantity is otherwise comparable to allowable sale quantity (ASQ). However, probable sale quantity does not reflect a commitment to a specific cut level. Probable sale quantity includes only scheduled or regulated yields and does not include "other wood" or volume of cull and other products that are not normally part of allowable sale quantity calculations.

Progeny Test Site - A test area for evaluating parent seed trees by comparing the growth of their offspring seedlings.

Proposed Threatened or Endangered Species - Plant or animal species proposed by the U.S. Fish & Wildlife Service to be biologically appropriate for listing as threatened or endangered and that is published in the Federal Register. It is not a final designation.

Public Domain Lands - Original holdings of the United States never granted or conveyed to other jurisdictions, or reacquired by exchange for other public domain lands.

Public Water System - A system providing piped water for public consumption. Such a system has at least 15 service connections or regularly serves at least 25 individuals.

Rearing Habitat - Areas in rivers or streams where juvenile salmon and trout find food and shelter to live and grow.

Recovery Plan - A plan for the conservation and survival of an endangered species or a threatened species listed under the Endangered Species Act; the plan's purpose is to improve the status of the species to make continued listing unnecessary.

Recreational River - See Wild and Scenic River System.

Reforestation - The natural or artificial restocking of an area with forest trees; most commonly used in reference to artificial stocking.

Regeneration Harvest - Timber harvest conducted with the partial objective of opening a forest stand to the point where favored tree species will be re-established.

Regeneration Period - The time it takes to reforest an area to adequate stocking following a timber sale.

Regional Ecosystem Office (REO) - The main function of this office is to provide staff work and support to the Regional Interagency Executive Committee so the standards and guidelines in the forest management plan can be successfully implemented.

Regional Interagency Executive Committee (RIEC) - This group serves as the senior regional entity to assure the prompt, coordinated, and successful implementation of the forest management plan standards and guidelines at the regional level.

Regulated Forest - A forest that comprises an even distribution of age classes or tree sizes when the growth equals the cut (at the highest level sustainable) and when the level of growing stock remains relatively constant.

Representative Timber Management Scenario - A set of assumed timber harvest units, road locations, and average annual levels of associated practices and intensive management practices for the decade of the expected life of the plan.

Research Natural Area (RNA) - An area that contains natural resource values of scientific interest and is managed primarily for research and educational purposes.

Reserved Federal Mineral Estate - Land on which the federal government has ownership of minerals, but the surface estate is private or other nonfederal ownership.

Resource Management Plan (RMP) - A land use plan prepared by the BLM under current regulations in accordance with the Federal Land Policy and Management Act.

Respending Effects - The jobs and income generated by the purchase of goods and services by businesses or employees in the sectors being examined. Example: Purchases of legal services by wood products companies and their employees is a respending effect that creates jobs and income for lawyers.

Restoration and Retention Blocks - Ecological reserves managed to restore or retain old-growth communities and respective plant communities.

Right-of-Way - A permit or an easement that authorizes the use of public lands for specified purposes, such as pipelines, roads, telephone lines, electric lines, reservoirs, and the lands covered by such an easement or permit.

Riparian Management Area - An area allocated in the plan primarily to protect the riparian and/or streamside zone.

Riparian Reserves - Designated riparian areas found outside Late-Successional Reserves.

Riparian Zone - Those terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated high water tables, and soils that exhibit some wetness characteristics. Normally used to refer to the zone within which plants grow rooted in the water table of these rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs, and wet meadows.

Ripping - The process of breaking up or loosening compacted soil to assure better penetration of roots of young tree seedlings.

Rotation - The planned number of years between establishment of a forest stand and its regeneration harvest.

Rural Interface Areas - Areas where BLM-administered lands are adjacent to or intermingled with privately-owned lands zoned for 1- to 20-acre lots, or areas that already have residential development.

Salable Minerals - High volume, low value mineral resources including common varieties of rock, clay, decorative stone, sand, and gravel.

Scarification - Mechanical removal of competing vegetation or interfering debris prior to planting.

Scenic Quality - The relative worth of a landscape from a visual perception point of view.

Scenic River - See Wild and Scenic River System.

Scribner Short Log - A log measurement rule constructed from diagrams that shows the number of 1-inch boards that can be drawn in a circle representing the small end of a 16-foot-long log, assumes a 1/4-inch saw kerf groove, makes a liberal allowance for slabs, and disregards log taper.

Sediment Yield - The quantity of soil, rock particles, organic matter, or other debris transported through a cross-section of stream in a given period of time. Measured in dry weight or by volume. Consists of suspended sediment and bedload.

Seed Tree Cutting Method - An even-aged reproductive cutting method in which all mature timber from an area is harvested in one entry except for a small number of trees left as a seed source for the harvested area.

Seed Orchard - A plantation of clones or seedlings from selected trees; isolated to reduce pollination from outside sources; weeded of undesirables; and cultured for early and abundant production of seed.

Selection Cutting - A method of uneven-aged management involving the harvesting of single trees from stands (single-tree selection) or in groups (group selection) without harvesting the entire stand at any one time.

Sensitivity Analysis - A process of examining specific trade-offs which would result from making changes in single elements of a plan alternative.

Sensitivity Levels - Measures (e.g., high, medium, and low) of public concern for the maintenance of scenic quality.

Seral Stages - The series of relatively transitory plant communities that develop during ecological succession from bare ground to the climax stage. There are five stages:

> **Early Seral Stage**: The period in the life of a forest stand from crown closure to ages 15-40. Due to stand density, the brush, grass, or herbs rapidly decrease in the stand. Hiding cover may be present.
>
> **Mid Seral Stage**: The period in the life of a forest stand from crown closure to first merchantability. Usually ages 15 through 40. Due to stand density, the brush, grass, or herbs rapidly decrease in the stand. Hiding cover is usually present.
>
> **Late Seral Stage**: The period in the life of a forest stand from first merchantability to culmination of mean annual increment. Usually ages 40 to 100 years of age. Forest stands are dominated by conifers or hardwoods; canopy closure often approaches 100 percent. During this period, stand diversity is minimal, except that conifer mortality rates and snag formation will be fairly rapid. Big game hiding and thermal cover is present. Forage is minimal except in understocked stands.
>
> **Mature Seral Stage**: The period in the life of a forest stand from culmination of mean annual increment to an old-growth stage or to 200 years. Conifer and hardwood growth gradually decline, and larger trees increase significantly in size. This is a time of gradually increasing stand diversity. Understory development increases in response to openings in the canopy from disease, insects, and windthrow. Vertical diversity increases. Larger snags are formed. Big game hiding cover, thermal cover, and some forage are present.
>
> **Old-Growth**: This stage constitutes the potential plant community capable of existing on a site given the frequency of natural disturbance events. For forest communities, this stage exists from approximately age 200 until the time when stand replacement occurs and secondary succession begins again. Depending on fire frequency and intensity, old-growth forests may have different structures, species composition, and age distributions. In forests with longer periods between natural disturbance, the forest structure will be more even-aged at late mature or early old growth stages.
>
> As mortality occurs, stands develop greater structural complexity. Replacement of trees lost to fire, windthrow, or insects results in the creation of a multi-layered canopy. There may be a shift toward more shade-tolerant species. Big game hiding cover, thermal cover, and forage is present.

Shelterwood Cutting - A regeneration method under an even-aged silvicultural system. A portion of the mature stand is retained as a source of seed and/or protection during the period of regeneration. The mature stand is removed in two or more cuttings.

Short Term - The period of time during which the RMP will be implemented; assumed to be l0 years.

Silvicultural Prescription - A professional plan for controlling the establishment, composition, constitution, and growth of forests.

Silvicultural System - A planned sequence of treatments over the entire life of a forest stand needed to meet management objectives.

Site Class - A measure of an area's relative capacity for producing timber or other vegetation.

Site Index - A measure of forest productivity expressed as the height of the tallest trees in a stand at an index age.

Site Preparation - Any action taken in conjunction with a reforestation effort (natural or artificial) to create an environment that is favorable for survival of suitable trees during the first growing season. This environment can be created by altering ground cover, soil, or microsite conditions through using biological, mechanical, or manual clearing, prescribed burns, herbicides, or a combination of methods.

Skid Trail - A pathway created by dragging logs to a landing (gathering point).

Skyline Yarding - A cable yarding system using one of the cables to support a carriage from which logs are suspended and then pulled to a landing.

Slash - The branches, bark, tops, cull logs, and broken or uprooted trees left on the ground after logging.

Slope Failure - See Mass Movement.

Smoke Management - Conducting a prescribed fire under suitable fuel moisture and meteorological conditions with firing techniques that keep smoke impact on the environment within designated limits.

Smoke Management Program - A program designed to ensure that:

- Smoke impacts on air quality from agricultural or forestry burning operations are minimized.
- Impacts do not exceed, or significantly contribute to, violations of air quality standards or visibility protection guidelines.
- Necessary open burning can be accomplished to achieve land management goals.

Smoke Sensitive Area - An area identified by the Oregon Smoke Management Plan that may be negatively affected by smoke but is not classified as a designated area.

Snag - Any standing dead, partially-dead, or defective (cull) tree at least l0 inches in diameter at breast height (dbh) and at least 6 feet tall. A hard snag is composed primarily of sound wood and is generally merchantable. A soft snag is composed primarily of wood in advanced stages of decay and deterioration; generally not merchantable.

Snag Dependent Species - Birds and animals dependent on snags for nesting, roosting, or foraging habitat.

Soil Compaction - An increase in bulk density (weight per unit volume) and a decrease in soil porosity resulting from applied loads, vibration, or pressure.

Soil Displacement - The removal and horizontal movement of soil from one place to another by mechanical forces such as a blade.

Soil Productivity - Capacity or suitability of a soil for establishment and growth of a specified crop or plant species, primarily through nutrient availability.

Soil Series - A group of soils developed from a particular type of parent material; having naturally-developed horizons that, except for texture of the surface layer, are similar in differentiating characteristics and in arrangement of the profile.

Special Areas - Areas that may need special management, such as management as an ACEC, RNA, ONA, environmental education area, or other special category.

Special Forest Products - Firewood, shake bolts, mushrooms, ferns, floral greens, berries, mosses, bark, grasses, and other forest material that could be harvested in accordance with the objectives and guidelines in the proposed resource management plan.

Special Habitat Features - Habitats of special importance due to their uniqueness or high value.

Special Recreation Management Area (SRMA) - An area where a commitment has been made to provide specific recreation activity and experience opportunities. These areas usually require a high level of recreation investment and/or management. They include recreation sites, but recreation sites alone do not constitute SRMAs.

Special Status Species - Plant or animal species falling in any of the following categories (see separate glossary definitions for each):

- Threatened or Endangered Species
- Proposed Threatened or Endangered Species
- Candidate Species
- State Listed Species
- Bureau Sensitive Species
- Bureau Assessment Species

Species Diversity - The number, different kinds, and relative abundance of species.

Split Estate - An area of land where the surface is nonfederally owned and the subsurface mineral resources are federally owned or vice versa.

Spotted Owl Habitat Sites - Sites monitored by BLM for spotted owl occupancy during some or all of the years I985 through I988 in accordance with BLM's spotted owl monitoring guidelines. These sites are known to have been inhabited by spotted owls at some time in the last dozen years, but not necessarily during the I985-I988 period.

Stand (Tree Stand) - An aggregation of trees occupying a specific area and sufficiently uniform in composition, age, arrangement, and condition to make it distinguishable from the forest in adjoining areas.

Stand Density - An expression of the number and size of trees on a forest site. May be expressed in terms of numbers of trees per acre, basal area, stand density index, or relative density index.

State Historic Preservation Officer (SHPO) - The state official authorized to act as a liaison to the Secretary of the Interior for purposes of implementing the National Historic Preservation Act of I966.

State Implementation Plan (SIP) - A state document required by the Clean Air Act. It describes a comprehensive plan of action for achieving specified air quality objectives and standards for a particular locality or region within a specified time, as enforced by the state and approved by the Environmental Protection Agency.

State Listed Species - Plant or animal species listed by the State of Oregon as threatened or endangered pursuant to ORS 496.004, ORS 498.026, or ORS 564.040.

Statewide Comprehensive Outdoor Recreation Plan (SCORP) - A plan prepared by the state that describes and analyzes the organization and function of the outdoor recreation system of the state. The plan provides an analysis of the roles and responsibilities of major outdoor recreation suppliers; an analysis of demand, supply and needs; issue discussions; an action program to address the issues; and a project selection process.

Stocked/Stocking - Related to the number and spacing of trees in a forest stand.

Strategic and Critical Minerals - Minerals that supply military, industrial, and essential civilian needs of the United States during a national defense emergency. They are not found or produced in this country in sufficient quantities to meet such needs. Nickel, cobalt, and chromium are examples of such minerals occurring in western Oregon.

Stream Class - A system of stream classification established in the Oregon Forest Practices Act. Class I streams are those that are significant for: 1) domestic use, 2) angling, 3) water-dependent recreation, and 4) spawning, rearing or migration of anadromous or game fish. All other streams are Class II. Class II special protection streams (Class II SP) are Class II streams that have a significant summertime cooling influence on the downstream Class I waters at or near a temperature limiting production of anadromous or game fish.

Stream Order - A hydrologic system of stream classification based on stream branching. Each small unbranched tributary is a first order stream. Two first order streams join to make a second order stream. Two second order streams join to form a third order stream and so forth.

Stream Reach - An individual first order stream or a segment of another stream that has beginning and ending points at a stream confluence. Reach end points are normally designated where a tributary confluence changes the channel character or order. Although reaches identified by BLM are variable in length, they normally have a range of 0.5 to 1.5 miles in length unless channel character, confluence distribution, or management considerations require variance.

Structural Diversity - Variety in a forest stand that results from layering or tiering of the canopy and the die-back, death, and ultimate decay of trees. In aquatic habitats, the presence of a variety of structural features (such as logs and boulders) that create a variety of habitat.

Succession - A series of dynamic changes by which one group of organisms succeeds another through stages leading to potential natural community or climax. An example is the development of series of plant communities (called seral stages) following a major disturbance.

Suitable Commercial Forest Land - Commercial forest land capable of sustained long-term timber production.

Suitable River - A river segment found through administrative study by an appropriate agency to meet the criteria for designation as a component of the National Wild and Scenic Rivers system, as specified in Section 4(a) of the Wild and Scenic Rivers Act.

Suitable Woodland - Forest land occupied by minor conifer and hardwood species not considered in the commercial forest land ASQ determination and referred to as noncommercial species. These species may be considered commercial for such things as fuelwood under woodland management. Also included are low site and nonsuitable commercial forest land. These lands must be biologically and environmentally capable of supporting a sustained yield of forest products.

Surface Erosion - The detachment and transport of soil particles by wind, water, or gravity. Surface erosion can occur as the loss of soil in a uniform layer (sheet erosion), in many rills, or by dry ravel.

Suspended Sediment - Sediment suspended in a fluid by the upward components of turbulent currents or by colloidal suspension.

Sustained Yield - The yield that a forest can produce continuously at a given intensity of management.

Sustained Yield Unit (SYU) - An administrative division for which an allowable sale quantity is calculated.

Target Stocking - The desirable number of well-spaced trees per acre at age of first commercial thinning.

Ten Percent Stocked - Stocking of tree seedlings and saplings (0.5 inches in diameter 4.5 feet above the ground) that are well distributed over the land and are more than 30 per acre in number; or the stocking of trees larger than 5 inches in diameter with foliage that covers at least l0 percent of the land surface area.

Texture (soil) - The relative proportion of sand, silt, and clay in a soil; grouped into standard classes and subclasses in the USDA Soil Survey Manual.

Thermal Cover - Cover used by animals to lessen the effects of weather. For elk, a stand of conifer trees that are 40 feet or more tall with an average crown closure of 70 percent or more. For deer, cover may include saplings, shrubs, or trees at least 5 feet tall with 75 percent crown closure.

Threatened Species - Any species defined through the Endangered Species Act as likely to become endangered within the foreseeable future throughout all or a significant portion of its range and published in the Federal Register.

Timber Management Plan - An activity plan that specifically addresses procedures related to the offering and sale of timber volume consistent with the approved allowable sale quantity.

Timber Production Capability Classification (TPCC) - The process of partitioning forest land into major classes indicating relative suitability to produce timber on a sustained yield basis.

Total Suspended Particulates - All solid or semi-solid material found in the atmosphere.

Transportation System - Network of roads used to manage BLM-administered lands. Includes BLM-controlled roads and some privately-controlled roads. Does not include Oregon Department of Transportation, county, and municipal roads.

Travel Corridor - A route used by animals along a belt or band of suitable cover or habitat.

Treatable Water - Water capable of being treated with commonly used filtration and chlorination systems.

Understocked - The condition when a plantation of trees fails to meet the minimum requirements for the number of well-spaced trees per acre.

Uneven-aged Management - A combination of actions that simultaneously maintains continuous tall forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes. Cutting methods that develop and maintain uneven-aged stands are single-tree selection and group selection.

Unique Ecosystems - Ecosystems embracing special habitat features such as beaches and dunes, talus slopes, meadows, and wetlands.

Unnecessary or Undue Degradation - Surface disturbance greater than what would normally result when an activity is being accomplished by a prudent operator in usual, customary, and proficient operations of similar character and taking into consideration the effects of operations on other resources and land uses, including those resources and uses outside the area of operation. Unnecessary and undue degradation may involve failure to initiate and complete reasonable mitigation measures—including reclamation of the disturbed area, creation of a nuisance, or failure to comply with applicable environmental protection statutes and regulations.

Utility Corridor - A linear strip of land identified for the present or future location of utility lines within its boundaries.

Viable Population - A wildlife or plant population that contains an adequate number of reproductive individuals to appropriately ensure the long-term existence of the species.

Viewshed - The landscape that can be directly seen from a viewpoint or along a transportation corridor.

Visibility Protection Plan - A plan that implements the requirements of the Clean Air Act by establishing programs for visibility monitoring; short and long term control strategies; and procedures for program review, coordination, and consultation.

Visual Resources - The visible physical features of a landscape.

Visual Resource Management (VRM) - The inventory and planning actions to identify visual values and establish objectives for managing those values and the management actions to achieve visual management objectives.

Visual Resource Management Classes - Categories assigned to public lands based on scenic quality, sensitivity level, and distance zones. There are four classes. Each class has an objective that prescribes the amount of modification allowed in the landscape.

Water Quality - The chemical, physical, and biological characteristics of water.

Water Quality Criteria - Basin-specific parametric values (e.g., temperature, dissolved oxygen, and turbidity) that are currently determined to be necessary for the maintenance of identified beneficial uses.

Water Quality Requirements - The three components of a water quality standard: basin-specific identified beneficial uses, the water quality criteria necessary to protect the identified beneficial uses, and antidegradation.

Water Yield - The quantity of water derived from a unit area of watershed.

Western Oregon Digital Data Base (WODDB) - A very high resolution (I inch = 400 feet) geographic digital (computer) data base derived from aerial photography for BLM-administered lands in western Oregon.

Wetlands or Wetland Habitat - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for live in saturated soil conditions. Wetlands generally include—but are not limited to—swamps, marshes, bogs, and similar areas.

Wet Meadows - Areas where grasses predominate. Normally waterlogged within a few inches of the ground surface.

Wild and Scenic River System - A national system of rivers or river segments that have been designated by Congress and the President as part of the National Wild and Scenic Rivers System (Public Law 90-542, 1968). Each designated river is classified as one of the following:

> **Wild River -** A river or section of a river free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. Designated wild as part of the National Wild and Scenic Rivers System.
>
> **Scenic River -** A river or section of a river free of impoundments, with shorelines or watersheds still largely primitive and undeveloped but accessible in places by roads. Designated scenic as part of the National Wild and Scenic Rivers System.
>
> **Recreational River -** A river or section of a river that is readily accessible by road or railroad, may have some development along its shorelines, and may have undergone some impoundment of diversion in the past. Designated recreational as part of the National Wild and Scenic Rivers System.

Wilderness Study Area (WSA) - A roadless area that has been inventoried and found to be wilderness in character, has few human developments, and provides outstanding opportunities for solitude and primitive recreation, as described in Section 603 of the Federal Land Policy and Management Act and in Section 2(c) of the Wilderness Act of I964.

Wildlife Tree - A live tree retained to become future snag habitat.

Wild River - See Wild and Scenic River System.

Windthrow - A tree or trees uprooted or felled by the wind.

Withdrawal - A designation that restricts or closes public lands from the operation of land or mineral disposal laws.

Woodland - Forest land producing trees not typically used as saw timber products and not included in calculation of the commercial forest land ASQ.

Yarding - The act or process of moving logs to a landing.

Yield Table - A table of timber volumes expected to be produced under a certain set of conditions.

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